C 21.5: 1053/5 Engin 260

Vol. 1053 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

The University of Michigan Engineering Library
THE UNIVERSITY OF MICHIGAN
AUG 9 1985
ENGINEERING LIBRARY

Route to:

PATENTS

April 30, 1985

JUL 08 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

April 30, 1985 Volume 1053 Number 5

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1053 OG 120
Notice of Maintenance Fees Payable	1053 OG 120
Board of Appeals Decisions Rendered	1053 OG 120
Reissue Applications Filed	1053 OG 121
Requests for Reexaminations Filed	1053 OG 121
Marks Published for Opposition	1053 OG 121
Patent Term Extension	1053 OG 121
Adverse Decisions in Interference	1053 OG 122
PTO Status	1053 OG 123
Patent Certificates of Correction	1053 OG 125
Disclaimers	1053 OG 125
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1053 OG 126
Condition of Patent Applications	1053 OG 127
Reexamination	1979
Reissue Patents Granted (31,873)	1981
Plant Patents Granted (5,448)	1983
Patents Granted	
General and Mechanical (4,513,449)	1985
Chemical (4,514,184)	2243
Electrical (4,514,579)	2355
Design Patents Granted (278,565)	2455
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 51
Classification of	
Patents (Including Reissues and Reexaminations)	PI 55
Designs and Plants	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs and Plants	PI 60
Change of Address Form and Subscription Order Form	Back Page

THE UNIVERSITY OF MICHIGAN
AUG 05 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 25/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

Note that the amount of the international search fee for the European Patent Office will change effective May 7, 1985 and the amounts of the International PCT fees will change effective May 28, 1985. For information on these fee changes see the notice appearing in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	No charge

Mar. 20, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Apr. 27, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,326,299 through 4,327,446

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of Mar. 1985

Affirmed	173
Affirmed in Part	30
Reversed	69
Total	272

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,350,264, Re. S.N. 651,867, Filed Sept. 18, 1984, Cl. 221/067, VENDING MACHINE FOR FLAT SHEET ARTICLES, Alois Muller, Owner of Record: *Opal Manufacturing, Inc., Toronto, Ontario, Canada,* Attorney or Agent: John J. Byrne, et al., Ex. Gp.: 311

4,356,268, Re. S.N. 665,393, Filed Oct. 26, 1984, Cl. 435/253, MICROORGANISM FOR TREATING WASTE WATER, Norio Shimizu, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Thomas E. Beall, Jr., et al., Ex. Gp.: 127

4,376,963, Re. S.N. 712,578, Filed Mar. 15, 1985, Cl. 360/135, COMPOSITE MAGNETIC RECORDING DISK, Jack P. Knoop, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Henry E. Otto, Jr., et al., Ex. Gp.: 233

4,383,417, Re. S.N. 712,876, Filed Mar. 18, 1985, Cl. 062/127, SOFT-SERVE FREEZER CONTROL, Tom V. Martineau, Owner of Record: *Stoelting, Inc., Kiel, Wis.,* Attorney or Agent: Henry C. Fuller, Jr., Ex. Gp.: 344

4,391,388, Re. S.N. 712,545, Filed Mar. 15, 1985, Cl. 221/076, CONTROL SYSTEM FOR INCREASING THE VERSATILITY OF AN ALL PURPOSE MERCHANDISER, Merrill Krakauer, Owner of Record: *Inventor,* Attorney or Agent: Henry L. Shenier, et al., Ex. Gp.: 311

4,397,901, Re. S.N. 668,817, Filed Nov. 6, 1984, Cl. 154/428, COMPOSITE ARTICLE AND METHOD OF MAKING SAME, James W. Warnen, Owner of Record: *Refractory Composites, Inc., Whitlien, Calif.,* Attorney or Agent: Ellsworth R. Roston, et al., Ex. Gp.: 154

4,461,353, Re. S.N. 713,914, Filed Mar. 20, 1985, Cl. 166/322, WELL SAFETY VALVE, Michael B. Vinzant, et al., Owner of Record: *Otis Engineering Corp., Carrollton, Tex.,* Attorney or Agent: Roland O. Cox, Ex. Gp.: 356

4,466,862, Re. S.N. 710,596, Filed Mar. 11, 1985, Cl. 162/055, METHOD FOR SCREENING, SEPARATING, AND REMOVING FIBER BUNDLES, LUMPS, KNOTS AND FOREIGN MATTER FROM AQUEOUS DISPERSIONS USED IN FORMING NON-WOVEN FABRICS BY WET-LAYING, Michael Ring, et al., Owner of Record: *International Paper Co., New York, N.Y.,* Attorney or Agent: Charles B. Smith, et al., Ex. Gp.: 133

4,477,955, Re. S.N. 714,156, Filed Mar. 20, 1985, Cl. 029/157.1R, METHOD OF PRODUCING A LINED STRUCTURE, James R. Becker, et al., Owner of Record: *Cameron Iron Works, Inc., Houston, Tex.,* Attorney or Agent: Jack R. Springgate, et al., Ex. Gp.: 326

4,489,812, Re. S.N. 714,166, Filed Mar. 20, 1985, Cl. 187/29R, ELEVATOR WITH POWER RECOVERY, Loren B. Ferris, Owner of Record: *Inventor,* Attorney or Agent: George A. Brace, et al., Ex. Gp.: 311

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,435,155, Reexam. No. 90/000,746, Requested: Mar. 25, 1985, Cl. 360/119, POLE PIECES FOR MAGNETIC HEADS WITH ACCURATELY DETERMINED GAP HEIGHTS, Bastiaan van der Voo, Owner of Record: *North American Phillips Co., Inc., New York, N.Y.,* Attorney or Agent: Frank R. Trifari, Ex. Gp.: 233, Requester: Control Data Corp., Minneapolis, Minn.

3,716,065, Reexam. No. 90/000,750, Requested: Apr. 1, 1985, Cl. 132/53, HAIRPIECE, Paul V. Finamore, Owner of Record: *World of Wigs Mfg. Co., Inc., Chicago, Ill.,* Attorney or Agent: Olson, Trexler, et al., Ex. Gp.: 332, Requester: Jerry Casper, Inc. & Francis G. Casper, Chicago, Ill.

3,831,481, Reexam. No. 90/000,740, Requested: Mar. 15, 1985, Cl. 83/674, CUTTER REELS FOR FIBER CUTTING APPARATUS, Donald W. van Doorn, et al., Owner of Record: *Lummus Industries, Inc., Columbus, Ga.,* Attorney or Agent: Jennings, Carter, et al., Ex. Gp.: 324, Requester: D. M. & E. Corp., Charlotte, N.C.

4,275,974, Reexam. No. 90/000,744, Requested: Mar. 21, 1985, Cl. 405/222, INFLATION AND GROUT SYSTEM, Lloyd C. Knox, et al., Owner of Record: *Halliburton Co., Duncan, Okla.,* Attorney or Agent: James R. Duzan, Ex. Gp.: 351, Requester: LTV Energy Products Co., Dallas, Tex.

4,405,156, Reexam. No. 90/000,748, Requested: Apr. 1, 1985, Cl. 281/29, REINFORCED HINGE FOR BOOK COVER, Leewood C. Carter, et al., Owner of Record: *Book Covers, Inc., Newark, N.J.,* Attorney or Agent: Weinstein & Sutton, Ex. Gp.: 327, Requester: Mead Corp., Washington, D.C.

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

Jan. 10, 1985.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Patent Term Extension
Private Law 98–34

The term of U.S. Patent 3,376,198 granted Apr. 2, 1968, has been extended for a period of fifteen (15) years in accordance with Private Law 98–34, approved Oct. 19, 1984. The text of that law is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce, acting through the Commissioner of Patents and Trademarks, shall, when patent numbered 3,376,198 (re-

lating to the production of antibodies in milk) expires, extend such patent for fifteen years, with all the rights pertaining thereto.

DONALD J. QUIGG
Acting Commissioner of Patents and Trademarks.

Apr. 5, 1985.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,028,319, David A. Jones, James M. Schlatter, Richard A. Mikulec, Judith A. Reuter and Robert H. Mazur, 2 AND 3-SUBSTITUTED ENKEPHALINS, Interference No. 101,285, decided Feb. 27, 1985, claims 4, 7, 10, 11 & 12.

Patent No. 4,089,830, Chojiro Tezuka and Yoshimitsu Karasawa, SETTING SOLUTION FOR DENTAL GLASS IONOMER CEMENTS, Interference No. 100,540, decided July 3, 1984 claims 1, 2 & 3.

Patent No. 4,151,260, Byron B. Woertz, HYDROGEN SULFIDE ABATEMENT IN GEOTHERMAL STEAM, Interference No. 100,265, decided Oct. 24, 1984, claim 25.

Patent No. 4,222,667, Charles R. Layne, FIZEAU FRINGE LIGHT EVALUATOR AND METHOD, Interference No. 100,741, decided Nov. 15, 1984, claims 1–15.

Patent No. 4,268,365, Tokuzo Iijima, Toshiharu Yamamoto, Kazuo Kishimoto, Takamichi Komabashiri and Toshiji Kano, METHOD OF ELECTROLYSIS OF AN ALKALI METAL CHLORIDE, Interference No. 100,783, decided Dec. 10, 1984, claims 1 & 9.

Patent No. 4,311,589, Robert C. Brumfield, TOROIDAL FLOW BLOOD REACTOR, Interference No. 101,098, decided Mar. 14, 1985, claims 1–5.

Patent No. 4,348,397, David C. May and Charles H. Jarboe, PROBENECID-DYPHYLLINE THERAPY, Interference No. 101,118, decided Feb. 15, 1985, claims 1–8.

Patent No. 4,370,494, George C. Wright and Ronald E. White, CONVERTING ENZYME INHIBITORS, Interference No. 101,111, decided Feb. 28, 1985, claim 1.

Patent No. 4,401,107, Terry M. Haber and William H. Smedley, INTESTINAL CONTROL VALVE, Interference No. 101,254, decided Feb. 20, 1985, claim 1.

Patent No. 4,404,652, Richard D. Holmes, SIDE FEED EXPANDER, Interference No. 101,215, decided Dec. 11, 1984, claims 1, 2, 3, 6 & 7.

Patent No. 4,418,321, Rolf Bohme, FEEDBACK AMPLIFIER OR THRESHOLD VALUE SWITCH FOR A CURRENT FEED DIFFERENTIAL STAGE, Interference No. 101,255, decided Feb. 21, 1985, claims 1, 2 & 6.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

Status of PTO Services

The following is an update of the status of PTO services for March 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	30	Filings have increased 9% so far this year. Staff being augmented.
Trademarks	30	30	Reduced 11 days since last month.
Patent/Trademark Copies:			
Window Coupons	5	98% within 5 days	
Mail Coupons	29	98% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		March 15, 1985	
Current Mail Date being processed		March 22, 1985	
Certified Copies:			
Trademark Registrations	30	21	
Applications-As-Filed	20	99% within 7 days	
File-Wrapper/Contents	N/A	95% within 7 days	
Walk-up Certification	1	99% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	31	Reduced 8 days since last month.
Filing Reg. Certificates	3	5	Reduced 4 days since last month.
Assignments:			
Patents	25	16	
Trademarks	25	17	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 1 day late	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	On schedule	
Patent Copies Available	Issue Date	95% within 1 day	Significant improvement since last month.
Trademark Copies Available	Issue Date	99% on Issue Date	

*Figures include postal processing and delivery time.

IMPROVEMENTS TO SERVICES

- *Patent and Trademark Copies* — Air mail delivery of copies is available upon request. Customers who desire air mail delivery must have a deposit account with the PTO. The Office will determine applicable postage fees as the order is being filled and will charge them to the deposit account.
- *CASSIS* — The Classification and Search Support Information Systems (CASSIS) has been enhanced by the addition of the Manual of Patent Examining Procedure (MPEP). The MPEP can now be searched on CASSIS to locate and, if desired, display the sections containing a given word or words. A new "User's Guide" is available in the Patent Public Search Room.
- *Photocopy Service Survey* — In the 1984 User Survey, 54% of the respondents rated photocopy services in the Public Search Rooms as being poor or fair. Since the PTO's monitoring reports indicated the copiers were available 93–99% of the time and quality was good 96–99% of the time, a survey was conducted to try to highlight the exact nature of the perceived problem. A random sample of 80 public users of photocopy equipment indicated the following:

Frequency of Use	*88% Frequent*	*12% Infrequent*
Machines Operational Most of the Time	86% Yes	14% No
Problems using Equipment	79% No	21% Yes (primarily Maintenance related)
Satisfied with Quality of Copies	83% Yes	17% No
Overall Rating of Photocopy Services	3% Excellent 48% Good 36% Satisfactory	12% Fair 1% Poor

Specific recommendations made by the respondents are being analyzed.

HELPFUL HINTS FROM THE PTO

- *Patent Applications* — We are trying to expedite and improve preliminary processing of patent applications. Please help by putting patent applications and associated papers (e.g. assignments) in separate envelopes from all other mail. Identify on the outside of the envelope "PATENT APPLICATION".
- *Application File Drawings* — Application Branch personnel are having some difficulty matching drawings with applications during pre-exam processing. It would be helpful if the applicant's name, docket number and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels. Identification on the back of the drawings would be greatly appreciated.
- *Certification Services* — Expedited service requests for certification of copies that have been made by the requester shall be limited to those files open for public inspection. If there is such a need for expedited service, the request should be made to the Manager, Examination Services Division. All other requests for copies must be made to the Certifications Branch, which will fill your request within 7 days or less.
- *New Application Filing Problems* — Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to applications which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.

Most often, the problems that arise in this area can be characterized as the following:

— Applicants continue to fail to comply with the requirements of 37 CFR 1.60 with regard to what must be submitted upon filing under the rule. This is true even after the clarifying amendments (effective Apr. 1, 1984) were made to the rule. This problem was also addressed in the Official Gazette Notice of May 8, 1984 entitled "Filing of Patent Applications Pursuant to 37 CFR 1.60."
A true copy of the prior application must be filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application.

— Applicants are using transmittal forms which request filings under one rule when, in fact, they wish to file under another rule. For example, a transmittal form requesting filing under 37 CFR 1.62 may be filed when it was really desired to file a divisional application under 37 CFR 1.60 and not to abandon the parent application.
Applications have also been filed with a transmittal form requesting filing under 37 CFR 1.60 when it was intended to file under 37 CFR 1.62. The confusion in the record of such applications must be clarified by a decision on petition before the applications can be processed for examination.

— Some applicants fail to realize that the parent application is abandoned by the filing of a continuing application under 37 CFR 1.62. Paragraph (g) of 37 CFR 1.62 states:

> "The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application."

Correction after such a mistaken filing under 37 CFR 1.62 usually requires a revival of the parent application under 37 CFR 1.137 (a) or (b) which expends resources of both the applicant and the PTO.

— Some applicants are attempting to file continuing applications under 37 CFR 1.62 after payment of the issue fee in the parent application. Such applications are improper and are not entitled to a filing date. Additionally, such filings will not affect the prior application, i.e., the parent application may issue as a patent. Paragraph (a) of 37 CFR 1.62 specifies that continuing applications may be filed under 37 CFR 1.62 "before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application".

— Some applicants are attempting to file continuation-in-part applications under 37 CFR 1.62 with a new specification rather than with the changes made by amendment to the prior application. As stated in 37 CFR 1.62(a) filings under 37 CFR 1.62 use the specification of the prior application.
Paragraph (c) of 37 CFR 1.62 also states:

> "In the case of a continuation-in-part application which *adds and claims additional disclosure by amendment,* an oath or delaration as required by §1.63 must also be filed. . . ." (emphasis added)

NOTICE

The February 12, 1985, Official Gazette Notice on "Availability of a Patent and Trademark Publication" is rescinded. The new edition of "The Story of the U.S. Patent Office" is not yet available.

Apr. 8, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 30, 1985

Pp. 5,315	4,442,360	4,470,664	4,482,356
Re. 31,155	4,443,197	4,470,697	4,482,559
D. 273,742	4,443,553	4,470,884	4,482,819
D. 275,212	4,444,652	4,471,101	4,482,854
D. 276,127	4,444,707	4,471,247	4,482,973
D. 276,173	4,444,769	4,471,310	4,483,092
D. 276,847	4,445,032	4,472,018	4,483,099
4,209,174	4,445,288	4,472,436	4,483,231
4,244,778	4,448,925	4,472,532	4,483,462
4,257,418	4,450,173	4,472,553	4,483,629
4,266,074	4,452,065	4,472,646	4,483,762
4,273,542	4,452,435	4,472,841	4,484,154
4,301,507	4,452,874	4,473,317	4,484,308
4,309,110	4,454,036	4,473,377	4,484,345
4,325,025	4,455,639	4,473,386	4,485,011
4,327,236	4,456,354	4,473,397	4,485,051
4,359,855	4,456,611	4,473,563	4,485,074
4,372,226	4,456,993	4,474,026	4,485,090
4,379,827	4,457,971	4,474,604	4,485,451
4,382,966	4,458,555	4,474,762	4,485,565
4,387,177	4,459,081	4,474,804	4,486,817
4,389,985	4,459,320	4,475,160	4,486,874
4,393,068	4,460,366	4,475,218	4,486,901
4,403,708	4,460,600	4,475,390	4,486,983
4,404,146	4,463,419	4,477,000	4,487,140
4,406,146	4,463,592	4,477,114	4,487,218
4,409,329	4,463,601	4,477,871	4,487,289
4,409,354	4,463,672	4,478,922	4,487,291
4,409,404	4,463,822	4,478,961	4,487,322
4,413,064	4,463,925	4,479,188	4,487,451
4,413,894	4,464,377	4,479,443	4,487,556
4,414,228	4,464,473	4,479,523	4,487,702
4,418,026	4,464,656	4,479,525	4,487,851
4,425,759	4,465,306	4,479,602	4,488,106
4,425,784	4,465,841	4,479,756	4,488,168
4,426,025	4,465,845	4,479,810	4,488,228
4,429,108	4,465,939	4,479,838	4,488,266
4,429,388	4,466,030	4,479,939	4,488,320
4,430,969	4,466,077	4,480,169	4,488,459
4,431,032	4,466,189	4,480,238	4,488,473
4,431,393	4,466,290	4,480,321	4,488,685
4,431,468	4,466,294	4,480,334	4,488,813
4,432,076	4,466,430	4,480,479	4,489,121
4,434,152	4,467,053	4,480,671	4,489,855
4,434,295	4,467,447	4,480,747	4,490,242
4,434,754	4,467,449	4,480,780	4,490,524
4,435,241	4,467,624	4,480,942	4,491,079
4,435,278	4,467,731	4,481,059	4,491,377
4,436,947	4,468,252	4,481,069	4,494,313
4,437,351	4,468,313	4,481,081	4,495,337
4,438,078	4,468,377	4,481,184	4,496,582
4,439,505	4,468,521	4,481,348	4,497,025
4,440,325	4,468,945	4,481,451	
4,441,266	4,469,539	4,482,260	
4,442,234	4,469,955	4,482,309	

Disclaimers

3,798,243.—*Istvan Toth,* Bottmingen, Base-Land, Switzerland. PROCESS FOR THE PRODUCTION OF 1-NITROANTHRAQUINONE. Patent dated Mar. 19, 1974. Disclaimer filed Nov. 7, 1983, by the assignee, *Fidelity Union Trust Co., Executive Trustee under the Sandoz Trust.*

Hereby enters this disclaimer to claims 1–4 and 6 of said patent.

3,948,441.—*Charles H. Perkins,* Newton Square; *Richard K. Nurnberg,* Norristown, both of Pa.; *Carl J. Goodhouse,* Litchfield, Conn. TIME VARIABLE THERMOSTAT. Patent dated Apr. 6, 1976. Disclaimer filed Mar. 11, 1985, by the assignee, *Robertshaw Controls Co.*

Hereby enters this disclaimer to claim 4 of said patent.

4,292,119.—*Howard L. Glass,* Orange, Calif. GROWTH OF SINGLE-CRYSTAL $2PBO.Fe_2O_3$. Patent dated Sept. 29, 1981. Disclaimer filed Mar. 18, 1985, by the assignee, *Rockwell International Corp.*

Hereby enters this disclaimer to claim 1 of said patent.

4,353,022.—*Richard A. Young,* Little Rock, Ark. TORQUE REVERSING MOTOR CONTROL STRUCTURE AND METHOD. Patent dated Oct. 5, 1982. Disclaimer filed Feb. 20, 1985, by the assignee, *Ceco Corp.*

The term of this patent subsequent to May 5, 1998 has been disclaimed.

4,367,004.—*Robert M. Booth, Jr.,* Wappingers Falls; *Chester A. Wasik,* Poughkeepsie, both of N.Y. SITU RATE AND DEPTH MONITOR FOR SILICON ETCHING. Patent dated Jan. 4, 1983. Disclaimer filed Mar. 11, 1985, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to claims 1–11 of said patent.

4,496,783.—*Ian M. Campbell; Donald L. Baulch,* Leeds, *Gary J. Audley,* Woking, all of England. NITRATION OF ORGANIC COMPOUNDS AND ORGANIC NITROGEN COMPOUNDS PRODUCED. Patent dated Jan. 29, 1985. Disclaimer filed Mar. 12, 1985, by the assignee, *Interox Chemicals Ltd.*

The term of this patent subsequent to Dec. 11, 2001 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 30, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-12-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-28-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-03-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-20-81
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-20-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-05-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-22-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-21-83

Expiration of patents: The patents within the range of numbers indicated below expire during March 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,371,351 to 3,375,528, inclusive

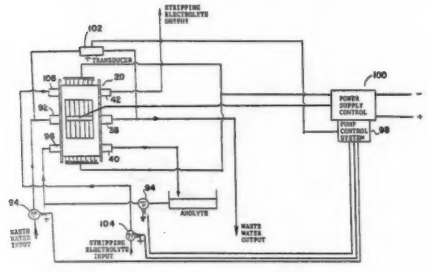
Plant Patents ..... Numbers 2,797 to 2,801 inclusive

REEXAMINATIONS

APRIL 30, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,326,938 (342nd)
PLANAR CARBON FIBER ELECTRODE STRUCTURE
Sankar Das Gupta; James K. Jacobs, and Samaresh Mohanta, all of Toronto, Canada, assignors to HSA Reactors Limited, Canada
Reexamination Request No. 90/000,458, Oct. 12, 1983.
Reexamination Certificate for Patent No. 4,326,938, issued Apr. 27, 1982, Ser. No. 99,522, Dec. 3, 1979.
Claims priority, application Canada, Apr. 12, 1978, 317327
Int. Cl.³ C25B *11/02;* **C02F** *1/46;* **H01M** *4/00*
U.S. Cl. 204—228



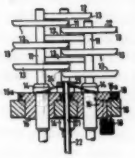
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **9**, **17** and **25** are determined to be patentable as amended.

Claims **2–8**, **10–16**, **18–24** and **26–32**, dependent on an amended claim, are determined to be patentable.

1. [An electrode] *A mono-polar electrode capable of alternate use as both a cathode and an anode* comprising a secondary electrode component including a surface comprising a metal selected from the group consisting of titanium, tantalum, tungsten, niobium, hafnium, and alloys thereof, said secondary electrode component including a plurality of holes therethrough so as to permit a flow of electrolyte therethrough, electrical contact means in electrical contact with said secondary electrode component so that outside electrical contact to said electrode is made through said secondary electrode component, a primary electrode component comprising a porous conductive material *having an outer surface and being* in electrical contact with said secondary electrode component *said outer surface of said porous conductive material being substantially free of said secondary electrode component,* whereby said electrode is capable of alternating between acting as a cathode and an anode by said secondary electrode component being conductive when said electrode is acting as a cathode, by becoming non-conductive when said electrode is acting as an anode, and by being capable of converting back to being conductive when said electrode is again acting as a cathode.

B1 4,033,105 (343rd)
YARN PROCESSING
David L. McNeight, Congleton, and William J. Morris, Didsbury, both of England, assignors to Rieter-Scragg Ltd., Macclesfield, England
Reexamination Request No. 90/000,591, Jul. 12, 1984.
Reexamination Certificate for Patent No. 4,033,105, issued Jul. 5, 1977, Ser. No. 335,727, Feb. 26, 1973.
Claims priority, application United Kingdom, Mar. 6, 1972, 10328/72
Int. Cl.³ D02G *1/04;* **D01H** *7/92*
U.S. Cl. 57—339



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **8–16** is confirmed.

Claims **1**, **2**, **4**, **5** and **7** are determined to be patentable as amended.

Claims **3** and **6**, dependent on an amended claim, are determined to be patentable.

1. A method of friction twisting a travelling yarn which comprises the steps of causing the yarn to move in contact with a *plurality of* travelling *peripheral* surfaces *of sets of overlapping discs rotatably arranged on three parallel axes* in a direction *generally* transverse to the direction of travel of the surfaces, and of moving [the] *each* travelling surface at a selected speed and selected angle in relation to the yarn speed, and direction of travel respectively *by said surfaces being so closely spaced and arranged, that each surface controls the yarn with respect to an adjacent such surface* giving the yarn a rolling and substantially slip- or skid-free contact with [the] *each* surface.

B1 4,334,944 (344th)
METHOD OF PREPARING POLYUREA FOAM MATERIALS
Hubert S. Creyf, Brugge, Belgium, assignor to PRB N.V., Brussels, Belgium
Reexamination Request No. 90/000,456, Oct. 7, 1983.
Reexamination Certificate for Patent No. 4,334,944, issued Jun. 15, 1982, Ser. No. 36,452, May 7, 1979.
Claims priority, application Netherlands, May 8, 1978, 7804908
Int. Cl.³ B29D *27/04;* **B32B** *5/18*
U.S. Cl. 156—308.2

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3**, **6**, **17**, and **19** is confirmed.

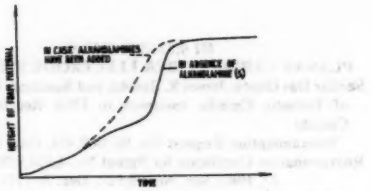
Claims **5** and **15** are cancelled.

Claims **4**, **7–14**, **18**, **20**, **22**, **23**, **25**, **26**, **28**, **29** and **31** are determined to be patentable as amended.

Claims **16**, **21**, **24**, **27** and **30**, dependent on an amended claim, are determined to be patentable.

New claims **32–42** are added and determined to be patentable.

1. A method of preparing polyurea foam materials, comprising reacting in the presence of at least one catalyst, at least one polyisocyanate with water, 0.5 to 50 parts by weight of at least one plasticizer per 100 parts by weight of polyisocyanate, 0.5 to 50 parts by weight, per 100 parts by weight of polyisocyanate, of at least one alkanolamine having a molecular weight of from 47 up to 2000, and having at least one hydroxyl group and at least one amine group to form a foam material and solidifying the foam as a semi-rigid polyurea foamed product characterized by a rise profile with an increased slope as compared with conventional polyurea foams.



REISSUES

APRIL 30, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,873

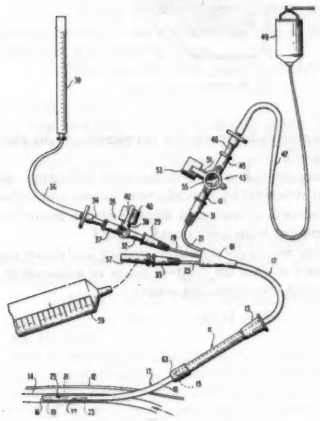
VENOUS CATHETER DEVICE

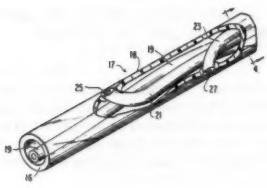
Randolph M. Howes, Rock Ranch Rd., Picayune, Miss. 39466

Original No. 4,072,146, dated Feb. 7, 1978, Ser. No. 721,215, Sep. 8, 1976. Application for reissue Jan. 19, 1983, Ser. No. 444,710

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—674 **5 Claims**





11. A venous catheter device including an elongated, flexible catheter tube provided with a distal end portion generally circular in cross-section and having a uniform outer diameter constructed for insertion into and capable of being fed longitudinally of a vein, a plurality of independent lumens extending freely through said catheter tube, each of said lumens having a distal terminus adjacent the distal terminus of the catheter tube and spaced from each other, one of said lumens having its distal end substantially coextensive with the distal end of said tube, the others of said lumens exiting at lateral openings in said tube and being joined thereto, at least two of said lumens providing means for infusing fluids into the blood stream, the proximate ends of the lumens extending beyond the proximate end of said catheter tube and being fitted with a lumen adapter for connection to independent fluid devices.

Re. 31,874

TREE-RESISTANT ETHYLENE POLYMER COMPOSITIONS

John K. Beasley, Wilmington, Del., and Edward J. Urban, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,374,224, dated Feb. 15, 1983, Ser. No. 301,513, Sep. 14, 1981. Application for reissue Nov. 2, 1983, Ser. No. 547,887

Int. Cl.³ C08K *5/12*

U.S. Cl. 524—298 **11 Claims**

1. A tree-resistant composition for use in [electrical equipment] *a power transmission cable*, said composition consisting essentially of an ethylene polymer selected from the group consisting of ethylene homopolymers and ethylene copolymers with at least one other ethylenically unsaturated monomer, ethylene being present in such copolymers in an amount of at least 85 weight percent, and, as a tree-growth inhibitor, an effective amount of at least one organic carboxylic ester having at least one *but no more than two* aromatic rings and at least three *but no more than four* carboxylic ester groups, *at least one carboxylic ester group being attached to one aromatic ring and the remaining carboxylic ester groups being attached to the other aromatic ring, if present, which is fused to the first aromatic ring or joined to it by a single bond, an alkylene group, a carbonyl group, or a hetero atom*, said inhibitor melting below about 50° C. and being liquid at the power transmission cable's intended operating temperature.

Re. 31,875

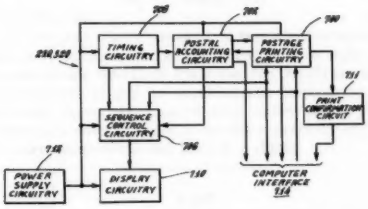
COMPUTER RESPONSIVE POSTAGE METER

Frank T. Check, Jr., Orange; Alton B. Eckert, Jr., Norwalk; Bruce E. Hinman, Ridgefield; Howell A. Jones, Jr., Fairfield; Raymond R. Lupkas, Trumbull, and Robert B. McFiggans, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Original No. 3,938,095, dated Feb. 10, 1976, Ser. No. 406,898, Oct. 16, 1973. Continuation-in-part of Ser. No. 195,694, Nov. 4, 1971, abandoned. Application for reissue Jan. 10, 1978, Ser. No. 868,473

Int. Cl.³ G06F *15/02, 15/24*; G07B *17/02, 17/04*

U.S. Cl. 364—900 **11 Claims**



1. In the combination of a computer and *postage* metering means arranged to print a numerical amount, said metering means including means for receiving from said computer a signal designating said amount, printing means responsive to said signal receiving means, an addressable memory for storing a *present* balance, an arithmetic unit responsive to said memory and said signal receiving means to alter said *present* balance by said computer-designated amount each time said printing means is actuated, memory addressing means for fetching a present balance from a predetermined memory address and conveying it to said arithmetic unit for said balance altering

operation and loading the new balance resulting from such operation back into said same memory address, said memory addressing means comprising:

a pulse stream source, a first counter responsive to said pulse stream, a gate responsive to said first counter, a second counter responsive to said gate, means for selecting a memory address in response to said second counter, means for detecting the beginning of a count sequence of said first counter, means for detecting the end of a count sequence of said second counter, and means responsive to both said count sequence detecting means for enabling said gate to start a memory addressing count sequence of said second counter at the beginning of said first count [sequence,] *sequence* and for disabling said gate at the end of said memory addressing count sequence.

Re. 31,876

PICTURE DISPLAY DEVICE

Masanori Watanabe, Katano; Kinzo Nonomura, Hirakata, and Yoshinobu Takesako, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 4,227,117, dated Oct. 7, 1980, Ser. No. 32,752, Apr. 24, 1979. Application for reissue Oct. 5, 1982, Ser. No. 433,023

Claims priority, application Japan, Apr. 28, 1978, 53/51808; Apr. 28, 1978, 53/51810; Aug. 30, 1978, 53/106788

Int. Cl.[3] **H01J** *29/70, 29/72*

U.S. Cl. 315—366 **19 Claims**

1. A picture display device comprising:

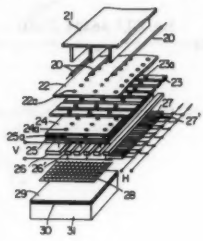
a plurality of linear thermionic cathodes;

partition means for separating said linear thermionic cathodes from one another;

electron beam extraction electrode means having a plurality of apertures formed therethrough in correspondence with said thermionic cathodes in the axial direction thereof for producing electron beams;

electron beam control electrode means comprising a plurality of electrodes including a plurality of apertures each thereof being coaxial with corresponding one of said apertures formed in said electron beam extraction electrode means, said control electrodes being arranged substantially perpendicular to said thermionic cathodes;

deflection electrode means for deflecting said electron beams;



acceleration electrode means for accelerating said electron beams; [and]

display means coated with a fluorescent substance which emits light when hit by said electron beams and including a display screen, at least said display screen being housed in a transparent glass container [.]; *and*

selective driving means for selectively driving said linear thermionic cathodes to emit an electron beam in cooperation with said electron beam extraction means.

PLANT PATENTS

GRANTED APRIL 30, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,448

ROSE PLANT—BLABEE

Daniel Blazey, Toledo, Ohio, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 26, 1983, Ser. No. 535,738
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by Rhodonite red and green-white bicolored flowers of good form borne one to a stem and clusters of four to eight blooms on a vigorous, attractive plant.

5,449

ROSE PLANT—SAVANHOUR

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 26, 1983, Ser. No. 535,735
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright red flowers of good high centered form which open well and retain color upon aging.

5,450

ROSE PLANT—SAVASPIR

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Sep. 26, 1983, Ser. No. 535,737
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright currant red flowers of good exhibition form and medium to heavy petalage with petals reflexing upon opening while retaining good form and flowers which are very long-lasting on the plant and after cutting.

5,451

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Oct. 11, 1983, Ser. No. 540,412
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by off-white colored flowers of good form borne one to a stem and in small clusters on a vigorous plant and which provides a general tonality of white with a tannish haze.

5,452

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Oct. 11, 1983, Ser. No. 540,411
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the

5,453

PLUM TREE, "EARLY GAR ROSA"

John M. Garabedian, 3104 E. Huntington Blvd., Fresno, Calif. 93702

Filed Sep. 26, 1983, Ser. No. 535,736
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described and broadly characterized by the ripening of its fruit approximately twenty days earlier than that of the unpatented Santa Rosa plum tree, which it most nearly resembles, but further differing therefrom in its regular and productive bearing of fruit having larger average size and firmer flesh when eating ripe, and the greater vigor of its tree.

5,454

NECTARINE TREE (MAY DIAMOND)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Sep. 23, 1983, Ser. No. 535,263
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of semi-freestone nectarine tree, substantially as illustrated and described, which most closely resembles May Grand Nectarine (U.S. Plant Pat. No. 4,791) and has fruit which ripens at the same time, but which is distinguished therefrom and is an improvement thereon in that its fruit colors earlier during ripening, and when shipping ripe has a fuller red color and is much firmer than May Grand and has a more acidic nectarine taste, and in that the pollen anthers frequently protrude out of the flower bud before the flower opens.

5,455

NECTARINE TREE (SPRING DIAMOND)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Sep. 23, 1983, Ser. No. 535,264
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of freestone nectarine tree, substantially as illustrated and described, which most closely resembles Mike Grand (U.S. Plant Pat. No. 4,791) but ripens about four days later and is further distinguished therefrom and an improvement thereon by fruit having a skin which is smoother and has a fuller red color when shipping ripe, and is somewhat larger and firmer when shipping ripe.

5,456

NECTARINE TREE (SUN DIAMOND)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Sep. 23, 1983, Ser. No. 535,265
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of freestone nectarine tree, substantially as illustrated and described, which most closely resembles Spring Red (U.S. Plant Pat. No. 3,619) but is distinguished therefrom and an improvement thereon by having fruit which ripens about seven days earlier and at shipping ripeness has a better firmness, a waxlike appearance of the skin, and a very symmetrical and attractive shape.

5,457

BLUE SPRUCE TREE "BABY BLUEYES" VARIETY

Verl L. Holden, 10374 Hazel Green Rd. NE., Silverton, Oreg. 97381

Filed Sep. 19, 1983, Ser. No. 533,277
Int. Cl.³ A01H *5/12*
U.S. Cl. Plt.50 **1 Claim**

1. A new and distinct variety of blue spruce tree, substantially as herein shown and described, characterized particularly as to novelty by its upright, semi-dwarf growth habit with early apical dominance; its naturally pyramidal configuration; its short, closely spaced needles; its high bud count; the delayed spring growth of its dormant buds; and its dense foliage, sky-grey in color.

PLANT PATENTS

GRANTED APRIL 30, 1963

PATENTS

GRANTED APR. 30, 1985

ERRATA

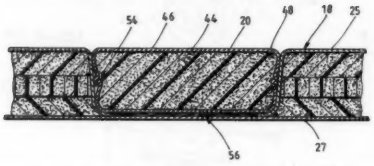
For CLASS	See PATENT NO.
132–011	4,513,842
248–544	4,513,994
138–106	4,514,103
514–184	4,514,390
514–002	4,514,391
514–148	4,514,392
514–213	4,514,394
514–224	4,514,395
514–222	4,514,396
514–247	4,514,397
514–245	4,514,398
514–241	4,514,399
514–252	4,514,400
514–253	4,514,401
514–250	4,514,402
514-274	4,514,403
514–265	4,514,404
514–046	4,514,405
514–352	4,514,406
514–220	4,514,407
514–212	4,514,408
514–383	4,514,409
514–221	4,514,410
514–215	4,514,411
514–397	4,514,412
514–397	4,514,413
514–422	4,514,414
514–470	4,514,415
549–442	4,514,416
514–482	4,514,417
514–508	4,514,418
514–521	4,514,419
514–689	4,514,420
514–711	4,514,421
250–423	4,514,610
361–385	4,514,746

PATENTS

GRANTED APRIL 30, 1985

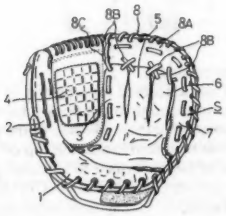
GENERAL AND MECHANICAL

4,513,449
SHOCK ABSORBING ATHLETIC EQUIPMENT
Byron A. Donzis, 23 Lana La., Houston, Tex. 77027
Continuation-in-part of Ser. No. 478,681, Mar. 25, 1983, which is a continuation-in-part of Ser. No. 357,588, Mar. 12, 1982, abandoned. This application May 18, 1983, Ser. No. 495,753
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **28 Claims**



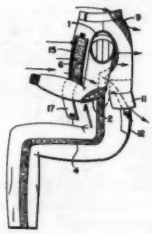
1. Shock absorbing athletic equipment for protecting a wearer from externally impacting forces, comprising:
a shock absorbing body portion designed to generally cover and protect at least a portion of a wearer's body, comprising,
a flexible enclosure defining an internal cavity therein, said flexible enclosure being generally impermeable to air,
means for placing said cavity within said enclosure in limited fluid communication with the exterior of said enclosure, and
a foam core retained within said cavity, said foam core formed of an open-celled material; and
a shock absorbing insert portion secured to said body portion and situated to contact a selected area of the body of said wearer, said insert having shock absorbing capability distinct from that of said shock absorbing body portion, said insert adapted to maintain said shock absorbing capability when impacted by a force of an anticipated magnitude.

4,513,450
BASEBALL CATCHING MEANS
Akio Aoki, Hirakata, Japan, assignor to Trion Corporation, Osaka, Japan
Filed Jan. 13, 1984, Ser. No. 570,318
Claims priority, application Japan, Dec. 28, 1983, 58-205107[U]
Int. Cl.³ A41D *13/10*
U.S. Cl. 2—19 **4 Claims**



1. A baseball glove, comprising:
a main body;
a thumb piece;
three finger pieces formed shorter than said thumb piece and each defining an upper end;
a little-finger piece, said thumb piece and three finger pieces being formed separately from each other, said thumb piece, three finger pieces and little-finger piece being connected to and extending from the main body;
a back stop disposed between said thumb piece and one of said finger pieces adjacent said thumb piece to connect said thumb piece and said finger-piece; and
a connection member formed integrally with said little-finger piece, said connection member being disposed along and connected to the upper ends of said three finger pieces and connected to said back stop, said connection member defining a ball catching surface along its extent.

4,513,451
VARIABLE VENTILATION SYSTEM FOR GARMENTS
Michael A. Brown, 5 Upper Trail, Fairfield, Pa. 17320
Filed Feb. 22, 1983, Ser. No. 468,584
Int. Cl.³ A41B *9/100*
U.S. Cl. 2—69 **17 Claims**



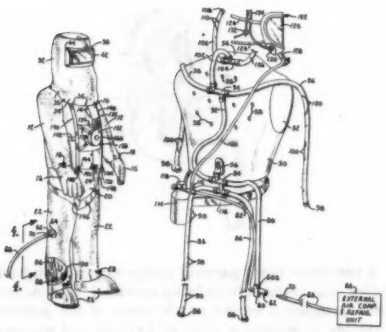
1. A ventilated outer garment comprising a front, back and two sides, said garment front being provided with one or more ventilation means disposed on the front of the garment for controllably permitting moving air to enter said garment and pass through said garment; the back of the garment being further provided with additional ventilation means for permitting said moving air to exit therefrom to thereby prevent billowing of the garment; entry of air through said front ventilation means being controlled by covering means disposed over said ventilation means and attached to said garment by means for permitting said covering means to be incrementally positioned over said front ventilation means.

4,513,452
HEAT RESISTANT SUIT FOR USE IN BOILER REPAIR
P. Phillip Rankin, Sr., R.R. #1, Box 178D, Tunas, Mo. 65764; R. Dewon Rankin, R.R. 2, Box 265, Buffalo, Mo. 65622, and Jacky P. Rankin, 302 S. Evergreen, Chanute, Kans. 66720
Filed Mar. 14, 1983, Ser. No. 475,061
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—81 **19 Claims**

1. A heat resistant suit for use in high temperature environments in excess of about 150° F., said suit comprising:
a pair of heat resistant boots;
heat resistant trousers having legs for overlapping the boots;
means for securing the trouser legs tightly against the boots in overlapping relation thereto;
a pair of heat resistant gloves;
a heat resistant coat having a waist portion for overlapping the trousers and a pair of arms for overlapping the gloves;
means for securing the waist portion of the coat tightly against the trousers in overlapping relation thereto;

a heat resistant hood having a transparent lens and a nedk portion for overlapping the coat;
means for securing the neck portion of the hood tightly against the coat in overlapping relation thereto;
a plurality of interconnected tubes extending within the trousers, coat and hood for applying cool air therein for cooling the body;
an inlet fitting on one of said legs of the trousers connected with said tubes for delivering cool air thereto; and
an elongate flexible hose having one end for receiving refrigerated air from an external source thereof and an opposite end adapted for coupling with said inlet fitting to deliver cool air thereto, said opposite end being disconnected from said inlet fitting in response to pulling on the hose with a force in excess of a preselected level.

14. A heat resistant suit for use in high temperature environments in excess of about 150° F., said suit comprising:
a pair of heat resistant boots;
heat resistant trousers having legs for overlapping the boots;
means for securing the trouser legs tightly against the boots in overlapping relation thereto;
a pair of heat resistant gloves;



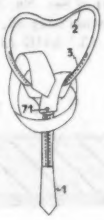
a heat resistant coat having a waist portion for overlapping the trousers and a pair of arms for overlapping the gloves;
means for securing the waist portion of the coat tightly against the trousers in overlapping relation thereto;
a heat resistant hood having a transparent lens and a neck portion for overlapping the coat;
means for securing the neck portion of the hood tightly against the coat in overlapping relation thereto;
a harness having a first set of straps on said coat and a second set of straps on said trousers;
releasable means for securing said first set of straps to said second set of straps when the coat and trousers are worn;
a reel carried on said harness;
a safety line wound on said reel and having a free end;
safety hook means on said free end of the safety line for releasable attachment to a support member; and
brake means for controlling the unwinding of said safety line from the reel,
whereby said safety hook means can be attached to the support member and a worker wearing the suit can descend therefrom with said brake means controlling the unwinding of said safety line from the reel to control the rate of descent of the worker.

4,513,453

PRE-TIED NECKTIE

Jiann Chen, and Ching H. Chen, both of No. 21, Alley 21, La. 244, Sec. 5, Yen-Ping North Rd., Taipei, Taiwan

Filed May 19, 1983, Ser. No. 496,057
Int. Cl.³ A41D *25/08*
U.S. Cl. 2—150 **5 Claims**



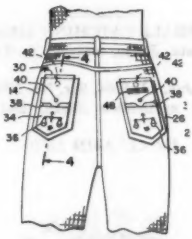
1. A necktie comprising an inner tie member, the upper end of said inner tie member being formed as a loop defining a neck-encircling opening; a zip fastener operatively mounted on said loop to enlarge and decrease the size of said opening, said zip fastener comprising a slide member having a slider plate attached thereto; a knot support having a hollow upper portion which is generally oval when viewed from above and tapers downwardly to a depending tongue; and an outer tie member; said inner tie member being disposed within said hollow knot support with the lower end thereof depending from the knot support; the upper end of said outer tie member, said knot support, and said slider plate being joined, each to the others, by fixing means; said outer tie member being formed into a knot around said knot support.

4,513,454

ZODIAC DESIGNER JEANS

Alan Anderson, 58 Canaan Circle, Greensboro, Ga. 30642, and George Spector, New York, N.Y., assignors to Alan Anderson, Greensboro, Ga.

Filed Oct. 24, 1983, Ser. No. 544,843
Int. Cl.³ A41D *27/20*
U.S. Cl. 2—246 **2 Claims**



1. A garment comprising:
a. a first piece of fabric formed for a pocket of the garment, slightly smaller in shape than the pocket having a symbol receiving area engaging the outer side of the pocket, a top flap member that is tucked inside the top of the pocket;
b. a second piece of fabric formed as an outer patch for the pocket of the garment, slightly smaller in shape than the pocket and attached to said symbol receiving area; and
c. means for removeably attaching said first piece of fabric to the pocket wherein said second piece of fabric having a zodiac symbol and a simulated pocket flap with snap wherein said means for removably attaching said first piece of fabric to the pocket is at least one press-stud

having a male portion attached to the top flap member and a female portion attached to said symbol receiving area so that when the top flap member is tucked into top of the pocket said male portion will be in alignment with said female portion and will pass through top of the pocket and into the female portion thereby causing said symbol receiving area and said flap member to lay in close engagement with said pocket.

4,513,455

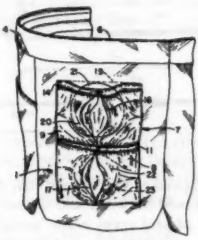
VERTICALLY STACKED DOUBLE POCKET

Gilbert C. Gerhardt, 225 Great Rd., Maple Shade, N.J. 08052

Filed Dec. 2, 1983, Ser. No. 557,625

Int. Cl.³ A41D *27/20*

U.S. Cl. 2—253 **9 Claims**



1. A vertically stacked double pocket affixed to the exterior of a garment, said pocket comprising a lower section and an upper section, said lower section closed at the bottom and open at the top into the bottom of said upper section, said upper section being open at the top and the bottom thereof, and a lower elastic band at the top of said lower section separating said upper and lower sections and an upper elastic band, said upper band being positioned at the top of said upper section, each said section closed at the top thereof only by said elastic band at the top thereof, each of said upper and lower sections being substantially equal in size and shape and vertically aligned and having the side edges of each section attached to said garment, and each section being dimensioned to receive and retain a ball.

4,513,456

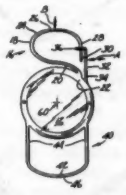
INTRAOCULAR LENS

Thomas C. White, 1127 Holly Dr., Sioux Falls, S. Dak. 57105

Filed Jun. 30, 1983, Ser. No. 509,420

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **3 Claims**



1. An intraocular lens device comprising:

(a) a lens for placement adjacent the side of the iris of an eye with its axis substantially aligned with the pupillary axis;

(b) fixation elements carried by the lens for supportive engagement with eye structure circumferential of the pupillary axis of the eye, at least one fixation element comprising an elongated resilient strut having a proximal portion carried by the lens, a medial portion having a contact surface engageable with said eye structure, and a distal portion extending inwardly from the medial portion toward the lens and having a free end to permit the contact surface to move elastically toward and away from the lens; and

(c) free end capture means comprising a second strut extending from the lens and having a loop at its outer end oriented to protectably receive the free end of the strut.

4,513,457

ARTICULATED HIP-JOINT FOR AN ARTIFICIAL LEG

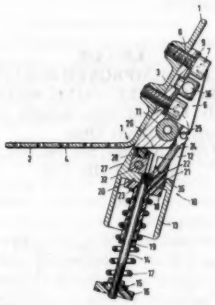
Richard Glabiszewski, Duderstadt, Fed. Rep. of Germany, assignor to Otto Bock Orthopädische Industrie KG, Duderstadt, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,848

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214773

Int. Cl.³ A61F *1/08, 1/04*

U.S. Cl. 3—15 **13 Claims**



1. An articulated hip-joint for an artificial leg, comprising a fastening angle including a substantially horizontal shank and a substantially upright shank extended at an obtuse angle to said horizontal shank; a first joint member connected to said upright shank; a second joint member connectable to the artificial leg and pivotally connected to said first joint member by a pivot so that said second member can be pivoted relative to said first member about said pivot between a first position corresponding to the standing position of the leg and a second position corresponding to the sitting position of the leg; stop surface means on said first member and said second member for limiting the pivoting movement of said second member relative to said first member; and elastic means on said second member for generating an elastic counter force applied to said second member when it is pivoted from said first position into said second position and vice versa so that said first joint member and said second joint member do not extend downwardly over an imaginary extension line drawn from said substantially horizontal shank, when the joint is in said second position.

4,513,458

FLOW SPOUT FOR LIQUID

Jean C. Delepine, 23 rue Clapeyron, 75008 Paris, France

Filed May 23, 1984, Ser. No. 613,256

Claims priority, application France, Jun. 24, 1983, 83 10480

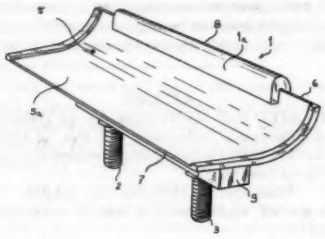
Int. Cl.³ E03C *1/04*

U.S. Cl. 4—192 **10 Claims**

1. A flow spout comprising a wide flat chamber in sheet form, in which at least one liquid inlet opens out, and which is in communication with the outside by a long narrow slot,

wherein it comprises a concave curved surface constituted at least in part by generatrices parallel to one another and disposed so that its generatrices are at least approximately horizontal and its rear edge is at a level higher than its front edge,

and said wide flat chamber is arranged so that its long, narrow slot is disposed on the rear edge side close to said



concave curved surface and at least substantially parallel to said generatrices.

4,513,459

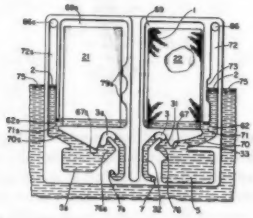
BLEACH CAKE IN AN IMPROVED BLEACH RESISTANT PARTICLE RETAINING MEANS

Elexsis D. Doughty, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 20, 1984, Ser. No. 591,370

Int. Cl.³ E03D *9/02*

U.S. Cl. 4—222 **11 Claims**



1. An article of manufacture comprising a solid cake of water-soluble calcium hypochlorite: CHARACTERIZED IN THAT:

a nonwoven water-permeable envelope contains said solid cake, said envelope made of a heat sealable substrate comprising a polyester fiber bonded with a polyvinyl chloride polymeric latex binder (PVC), said substrate having a basis weight of from 30 to 55 g/m², and a weight ratio of said PVC/Polyester of about 20:80 to about 60:40; said substrate having a minimum wet bending value of 3 mm.

4,513,460

SOFA SLEEPER SEAT SUPPORT SYSTEM

Darrell L. McIntire, St. Louis, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 21, 1983, Ser. No. 487,175

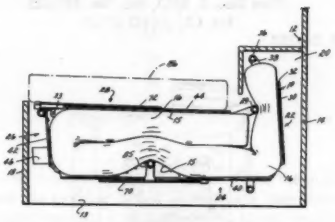
Int. Cl.³ A47C *17/04*

U.S. Cl. 5—13 **4 Claims**

1. A foldable sofa sleeper bed frame adapted to be mounted upon a sofa frame having back, front and side members which define a generally rectangular storage enclosure, said foldable bed frame comprising a plurality of pivotally interconnected head, body, intermediate and foot sections, said bed frame sections each including a pair of opposed side rails and a mattress supporting deck located between said side rails, and means supporting said bed frame for movement between (1) a retracted folded position in which the bed frame is contained within said storage enclosure, and (2) an extended position in which said bed frame lies above and extends forwardly over said front frame member to form a generally horizontal planar bed, said bed frame when in said extended position being supported by a first pair of foldable legs pivotally connected to the foot bed frame section and a second pair of foldable legs connected to said bed frame intermediate said first pair of foldable legs and said head end of said frame,

a foldable mattress mounted atop said mattress deck, and

a seat support system for engaging and supporting the underside of said mattress supporting deck when said bed frame is in said retracted folded position contained within said storage enclosure, said seat support system comprising,



a cross brace attached to said second pair of legs, said cross brace being bowed between said second pair of foldable legs, the bow of said cross brace being convex substantially upward approximately two inches out of the horizontal plane when said bed frame is in a retracted folded position to form a sofa seat so that said cross brace is engageable with the underside of said mattress supporting deck to force said mattress supporting deck upwardly when said bed frame is in said retracted folded position.

4,513,461

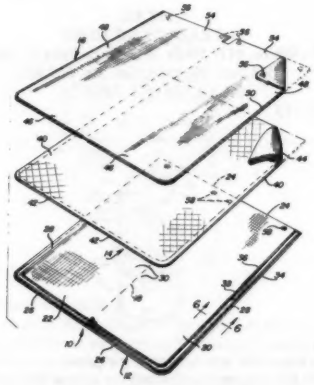
SLEEPING BAG WITH REMOVABLE SHEET

Monique M. Tardivel, Sedona, Ariz., assignor to Georges M. Tardivel, Venice, Calif.

Filed Jan. 11, 1984, Ser. No. 570,608

Int. Cl.³ A47G *9/08*

U.S. Cl. 5—413 **9 Claims**



1. A flexible sleeping bag of the type including a first outer panel foldable upon itself to form opposing panel portions, each of said panel portions defining first and second transverse edges and first and second longitudinal edges, said second longitudinal edges being integrally joined by the portion of said panel to be folded, elongated inner and outer flaps extending along said second transverse edges and said first longitudi-

nal edges, the outer flap being equipped with first slide fastening means, for removably joining said second transverse edges and said first longitudinal edges, a second intermediate insulation panel of generally the same size and shape as, but slightly smaller than, said outer panel and overlying the latter, coacting strip fastener means extending along said first longitudinal edges and said second transverse edges as well as the corresponding edges of said insulation panel removably joining said insulation panel to said outer panel, and a third inner sheet panel of generally the same size and shape, but slightly smaller than said first panel, said inner flap and the corresponding edges of said third inner panel including coacting second slide fastener means extending therealong inwardly of said first slide fastener means removably joining said third panel to said inner flap of the first panel, said strip fastener means being anchored to said first longitudinal edges and said second transverse edges substantially beneath said inner flap.

4,513,462

THERAPEUTIC PILLOW

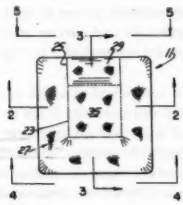
Charles R. Thomas, 9696 Northlawn, Detroit, Mich. 48204

Filed Nov. 28, 1983, Ser. No. 555,498

Claims priority, application European Pat. Off., Apr. 15, 1983, 83302133.0

Int. Cl.³ A47G *9/00*

U.S. Cl. 5—442 **10 Claims**



1. A therapeutic pillow comprising a soft resilient bottom pillow section;

a top pillow section superimposed thereover and peripherally secured thereto;

the top section including a top fabric cover and an underlying first bottom fabric cover with said covers peripherally interconnected;

continuous rectangular stitching interconnecting said covers and spaced inwardly of the corresponding peripheral connection of said covers;

spaced stitching extensions between said rectangular stitching and one edge of said covers defining a first tubular firm neck support of rectangular shape, exteriorly and transversely convex;

said peripheral connection and rectangular stitching defining a supplemental tubular firm neck support of U-shape, exteriorly and transversely convex;

first compacted stuffing of resilient fibrous material confined and retained within said first neck support;

second compacted stuffing of resilient fibrous material confined and retained within said supplemental neck support;

said bottom section including a second bottom fabric cover generally spaced from and parallel to said first bottom cover and peripherally connected thereto defining a rectangular chamber underlying said top pillow section;

and a loosely confined stuffing of resilient fibrous material enclosed and retained within said chamber yieldably underlying said top pillow section.

4,513,463

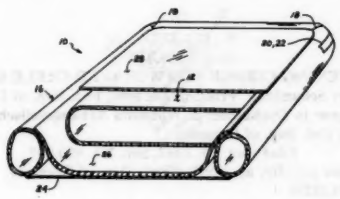
FLOATATION SLEEP SYSTEM

Philip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625

Continuation-in-part of Ser. No. 450,022, Dec. 15, 1982, abandoned. This application Mar. 14, 1983, Ser. No. 475,332

Int. Cl.³ A47C *27/10*; A61G *7/04*

U.S. Cl. 5—452 **14 Claims**



1. An improved floatation sleep system comprising:

means for supporting a human body;

means for forming a marginal perimeter support for said body supporting means, said support means including a continuous elongated chamber;

a first flexible, dimensionally stable, fluid impervious sheet connected to an upper portion of said elongated chamber, such sheet being of an overall dimension greater than the distance between opposed portions of such chamber and less than the distance between such opposed portions plus twice the vertical height of such chamber; and

a second flexible, dimensionally stable sheet extending between opposed portions of said elongated chamber, said second sheet being integrally connected to an upper portion of a part of such chamber and readily releasably secured to the remaining part of such upper portion; whereby said first and second sheets form a completely enclosed interior chamber adapted to receive and contain said body supporting means, such interior chamber being accessible through such releasably secured part of said second sheet and said elongated chamber.

4,513,464

METHOD FOR CONTROLLING THE ACCELERATION OF A CENTRIFUGING DEVICE

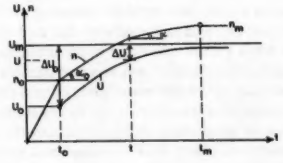
Jakob Rettich, Zürich, and Leonhard Spiewok, Wallisellen, both of Switzerland, assignors to Sulzer-Escher Wyss Ltd., Zürich, Switzerland

Filed Nov. 22, 1983, Ser. No. 554,454

Claims priority, application Switzerland, Dec. 14, 1982, 7261/82

Int. Cl.³ D06F *33/02*

U.S. Cl. 8—159 **9 Claims**



1. A method for controlling the acceleration to design speed of a centrifuging device subject to variable imbalance, the method comprising the steps of measuring the imbalance as the device is accelerated; limiting speed changes of the device to a positive range of acceleration values including zero; and regulating acceleration of the device within that range solely as a function of the difference between the measured imbalance and

a threshold value, whereby the acceleration period is kept short while avoiding excessive imbalance.

4,513,465

STIFFENING GIRDER FOR A STAYED CABLE BRIDGE

Herbert Schambeck, Frieding-Andechs, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,995

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132398

Int. Cl.³ E01D *11/00*

U.S. Cl. 14—17 **8 Claims**

1. Stiffening girder, formed of one of reinforcing concrete and prestressed concrete, for a stayed cable bridge comprising a multi-cell box elongated in the long direction of said bridge and closed in the elongated direction, means for supporting said box including cables inclined in the elongated direction of and secured to said box, said cables arranged in at least one upwardly extending support plane extending in the elongated direction of and upwardly from said box, said box comprising only parts having the long dimension thereof extending in the long direction of said box and being free of parts having the long dimension thereof extending transversely of the long direction of said box, said box comprising a generally horizontally extending continuous roadway slab forming the upper part of said box and having a pair of opposite edges extending in the long direction of said box, at least a plurality of webs extending downwardly from said roadway slab with said webs elongated in the long direction of said box and extending continuously along the underside of said roadway slab, at least one said web located interiorly within said box, and a continuous bottom slab spaced downwardly from said roadway slab with said webs extending between said roadway slab and bottom slab, said roadway slab said webs and said bottom slab each comprises a plate-like member extending in the elongated direction of said box and said roadway slab said webs and said bottom slab form a truss extending in the direction transverse to the elongated direction of said box and capable of transferring vertical loads at the junction points of said truss whereby said truss is capable of transferring the forces acting in said box to said means for supporting said box without the use of additional structural members, such as transverse girders, tension or compression diagonal rods and the like, extending in the direction transverse to the long direction of said box, and at least some of said webs extending at an acute angle relative to the plane of said roadway slab and a different one of said webs located adjacent to each of said opposite edges of said roadway slab and extending upwardly at an acute angle relative to said roadway slab and bottom slab from said bottom slab to a location on said roadway slab adjacent to the corresponding one of said opposite edges.

4,513,466

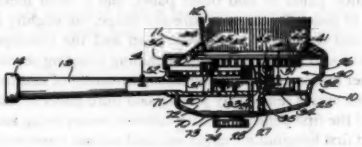
WATER-POWERED BRUSH

David P. Keddie, and Richard J. Shaw, both of Brookfield, Wis., assignors to Hempe Manufacturing Co., New Berlin, Wis.

Filed Sep. 24, 1984, Ser. No. 653,365

Int. Cl.³ A46B *13/06*

U.S. Cl. 15—29 **5 Claims**



1. A water-powered brush comprising:

a housing having a generally planar nominally top wall and a perimetral wall defining the boundaries of the top wall and extending from the top wall to define the boundary of a bottom opening in the housing,

a curved barrier wall having the configuration of a segment of a circle projecting from said top wall toward said bottom opening,

a first boss projecting from said top wall toward said bottom opening and a first fixed shaft at the center of curvature of said barrier wall and extending from the boss such that the free end of the boss provides a bearing shoulder,

a water supply conduit joined to said housing and terminating in an orifice in said barrier wall for projecting a jet of water generally tangentially to the curvature of the barrier wall,

a turbine rotor comprised of a disk and a first pinion projecting integrally and coaxially from one side of the disk in the direction of said bottom opening, said disk and pinion having a coaxial bore of sufficient diameter to provide for fitting over said boss with substantial clearance, said disk having a plurality of circumferentially spaced apart peripheral turbine blades extending into proximity with said barrier wall for said jet to impel said rotor,

a second boss located radially outwardly of said circular barrier wall and extending away from said top wall and a second shaft extending from said second boss in parallelism with said first shaft,

a gear and a second pinion integral and coaxial with said gear and having a common bore for being jointly rotatable on the shaft extending from said second boss while bearing on said second boss with said gear meshing with said first pinion,

brush means including a circular base member having a circular array of bristles extending from one side and a second gear on the opposite side and a cylindrical shaft extending axially from the center of the second gear, said cylindrical shaft having a bore for fitting in bearing relationship on said first stationary shaft and having an outside diameter for fitting into the bore of the pinion on said turbine rotor so the rotor is journaled for rotation on said cylindrical shaft while the gear on said base member is meshed with said second pinion to drive said brush means rotationally, and

a retainer cover and means for coupling said cover to said housing to close its said bottom opening, said cover having a hole for said brush to extend through the rim of said hole underlying the margin of said circular base member to thereby retain said brush means on said first shaft whereupon said brush means is held in a position for preventing said gears, pinions and rotor from sliding off of their shafts.

4,513,467

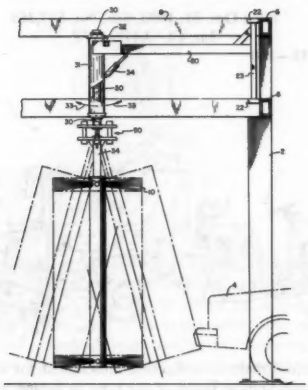
VEHICLE WASHING APPARATUS HAVING A YIELDABLE BRUSH SHAFT COUPLING

James W. Roncaglione, 9807 Bridleridge Ct., Vienna, Va. 22180

Continuation of Ser. No. 415,928, Sep. 8, 1982, abandoned. This application May 23, 1984, Ser. No. 613,018

Int. Cl.³ B60S 3/06

U.S. Cl. 15—53 AB 8 Claims



1. A vehicle wash apparatus, comprising:

a generally horizontal overhead brush support arm wherein at least one end of said brush support arm is located above the path of a vehicle to be washed;

a generally vertical shaft housing pivotally connected with said support arm about a horizontal pivot axis;

a shock absorber connecting said shaft housing and said brush support arm for minimizing the swinging movement about said horizontal pivot axis between said shaft housing and said support arm;

an elongate rotatable brush arranged in the path of a vehicle to be washed, said rotatable brush being rotatable about a generally vertical axis of rotation for washing at least one end and one entire side surface of a vehicle moving relative thereto;

a lower rotatable shaft secured to said rotatable brush;

drive means for imparting rotational movement to said brush;

an upper rotatable shaft located in said shaft housing and being connected with said drive means; and

coupling means for coupling said upper and lower rotatable shafts, said coupling means including (a) an upper plate secured to said upper shaft, (b) a lower plate secured to said lower shaft, and (c) three or more rigid connecting members radially disposed about said axis of rotation which operably connected said upper plate with said lower plate, which prevent said upper and lower plates from moving more than a predetermined distance apart from each other, and which allow said plates to tilt relative to each other during rotation of said brush from a first normal position when said brush is rotating freely about said generally vertical axis of rotation to a second washing position when said brush contacts a vehicle being washed and tilts from said generally vertical axis of rotation.

4,513,468

WINDSHIELD WIPER ELEMENT

William L. Hayden, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1983, Ser. No. 520,881

Int. Cl.³ B60S 1/38

U.S. Cl. 15—250.36 2 Claims

1. A squeegee element for a windshield wiper blade of the type having a rigid backing strip having a channel formed therein for mounting the squeegee element, the squeegee element being integrally formed from an elastomer to comprise:

A. an elongated T-shaped mounting portion received in the backing strip channel including a unitary stem portion extending outwardly therefrom and a bullbous main body portion;

B. a tip portion of substantially rectangular cross-section formed at the end of the main body portion remote from the stem portion;

C. said main body portion being teardrop shaped in cross-section and having convex outer surfaces extending in the lateral direction and symmetrically arrayed about a vertical plane extending through the stem portion and the tip portion, said convex outer surfaces each having equal radii of curvature, and wherein convex upper surfaces are formed on each of the convex outer surfaces at locations adjacent the backing strip, each convex upper surface having a larger convex radius of curvature than the radii of curvature of said convex outer surfaces, the centers of the convex outer surfaces falling on either side of said vertical plane and the centers of the convex upper surfaces falling in the vertical plane; and

D. means defining a smooth cross-sectional transition on the surface of the element between said main body portion and said tip portion.

4,513,469

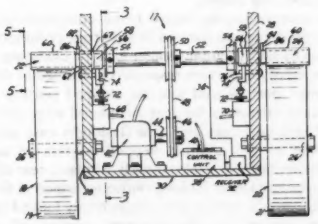
RADIO CONTROLLED VACUUM CLEANER

James O. Godfrey, and Robert E. Godfrey, both of 3612 Bali Dr., Sarasota, Fla. 33582

Filed Jun. 13, 1983, Ser. No. 503,771

Int. Cl.³ A47L 9/28

U.S. Cl. 15—319 16 Claims



1. A remote-radio controlled vacuum cleaner comprising a conventional vacuum cleaner having a body, radio signals transmitting means, radio signals receiving means mounted in

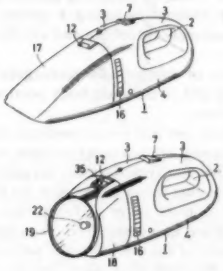
said body, a pair of ground engaging wheels each mounted on a side of said body, a driveshaft extending transversely through said body and having at each end a drive roller in frictional engagement with the periphery of one of said wheels, reversible electric motor drive means in said body for driving said driveshaft, and means for selectively disengaging one of said drive rollers from the periphery of a corresponding wheel upon said radio receiver receiving a steering control command signal, means for reversing the direction of drive of said electrical motor upon said radio receiver receiving an appropriate directional command signal, and means for allowing each said drive roller to be manually lifted from the periphery of each of said wheels for manual operation of said vacuum cleaner.

4,513,470

COMBINED STRUCTURE OF HAND-HELD CORDLESS VACUUM CLEANER AND FLASHLIGHT

Syouichi Toya, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 13, 1984, Ser. No. 579,718
Claims priority, application Japan, Jun. 13, 1983, 58-106551
Int. Cl.³ A47L *5/24*
U.S. Cl. 15—328 **10 Claims**



1. A combined structure of a hand-held cordless vacuum cleaner and a flashlight comprising;

a vacuum cleaner body having a handle portion, housing therein a battery and an electric powered blower driven by said battery, and including switch means adapted to control power fed to said blower;

a dust case housing therein a filter;

a flashlight case including a lighting unit and switch means for said lighting unit;

interconnecting means adapted to releasably interconnect either one of said dust case and said flashlight case to said vacuum cleaner body; and

electrical connection means adapted to electrically connect said battery in said vacuum cleaner body to said lighting unit in said flashlight case when said flashlight case is interconnected to said vacuum cleaner body by said interconnecting means,

said interconnecting means being composed of; an annular stepped portion formed in the front peripheral edge portion of said vacuum cleaner body; a clamping portion and an engaging portion respectively formed in the upper and lower part of said annular stepped portion; an annular recess formed in the rear peripheral edge portion of each of said dust case and said flashlight case and releasably fitted to the annular stepped portion of said vacuum cleaner body in a substantially fore-and-rear direction; and upper and lower locking portions formed in the vicinity of said annular recess to be respectively locked to the clamping portion and the engaging portion of said annular stepped portion,

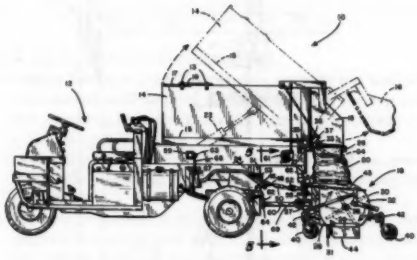
and said electrical connection means being composed of; a recess formed in the annular stepped portion of said vacuum cleaner body; battery side connection terminals disposed in said recess and led to said battery; and light bulb side connection terminals projected to the annular recess of said flashlight case, led to said lighting unit and coming into the recess in the annular stepped portion of said vacuum cleaner body to be brought into contact with said battery side connection terminals when said flashlight case is interconnected to said vacuum cleaner body.

4,513,471

SWEEPER BLOWER DEVICE

Raymond A. Rahn, 22125 Albatross Clr., Farmington, Minn. 55024

Filed Oct. 31, 1983, Ser. No. 547,369
Int. Cl.³ A47L *5/12*
U.S. Cl. 15—340 **13 Claims**



1. A refuse material collecting attachment for a motorized vehicle, said vehicle being of the type including a frame supported by a plurality of wheels, at least one of said wheels being driven by an engine, the engine having a power take-off member and said refuse material collecting attachment comprising:

(a) a box-like hopper having a floor, side, front and rear walls, the hopper being pivotably secured to said frame proximate the junction of said floor and said rear wall thereof, said hopper having an opening in said rear wall through which refuse material can pass;

(b) means for rotating said hopper about the pivot between a first disposition where the floor of said hopper is resting on said frame and a second disposition in which said floor is elevated relative to said frame;

(c) a wheel supported housing having a width dimension approximately the same as the width of said hopper and an elongated opening in the upper and lower surfaces of said housing;

(d) impeller means journaled for rotation within said housing about an axis which is aligned with the width dimension thereof, said impeller means having at least one flexible brush element;

(e) means coupling said impeller means to said power-takeoff member for rotating same whereby said brush element creates an upwardly directed suction force on articles of refuse material disposed below said opening in said lower surface of said housing;

(f) a flexible tubular conduit extending upwardly from said opening in said upper surface of said housing toward said opening in said rear wall of said hopper;

(g) a cover member pivotably secured to said hopper and extending between said opening in said rear wall and said tubular conduit when said hopper is in said first disposition for directing refuse material picked up by said impeller means through said opening in said rear wall of said hopper;

(h) means pivotably connected to said hopper proximate the intersection of said floor and said rear wall for gating the flow of refuse material; and

(i) linkage means extending between said cover member and said gate means for positioning said gate means in blocking

relationship with respect to said tubular conduit when said hopper is elevated to said second disposition.

4,513,472

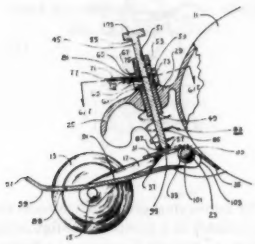
HEIGHT ADJUSTMENT MECHANISM

R. Leon Wells, 1649 Manor Dr., Vista, Calif. 92083

Filed Nov. 7, 1983, Ser. No. 548,995

Int. Cl.³ A47L *5/34*

U.S. Cl. 15—354 **17 Claims**



16. A foot-activated nozzle height-adjustment mechanism to replace the nozzle height-adjustment screw in an upright floor vacuum cleaner of the type characterized by having a front floor cleaning nozzle that is pivotally adjustable in height about the front wheels through raising and lowering an upwardly biased rear wheel carrier fork in contact with the screw, comprising:

(a) an elongated hollow tube of finite length, having top and bottom ends respectively, for threaded receipt in the same hole as the replaced adjustment screw;

(b) a shaft slideably received in said tube having top and bottom ends respectively wherein said bottom end extends beyond said bottom tube end for height-adjustment contact with the rear wheel carrier fork and said top end extends beyond said top tube end and includes a wide cap to prevent said shaft from dropping out of said tube;

(c) an exposed mounting cap encircling said tube and including a wide aperture formed in one side thereof tapering inwardly to expose said shaft and comprising top and bottom aperture surfaces;

(d) a first lever having one end in said aperture between said surfaces and having a hole formed therein, slightly larger than said shaft, for receipt therethrough by said shaft, and extending outward and rearward of the vacuum cleaner and arranged to loosen on said shaft when depressed and fixedly clasping said shaft to prevent upward movement within said tube when raised;

(e) leaf spring means in said aperture to bias said lever in an upward, shaft-locked position;

(f) coil spring means attached to said bottom end of said shaft to bias said shaft downward and against the rear wheel carrier fork of less bias pressure than the upward bias pressure on said carrier fork; and,

(g) a second lever centrally disposed between the rear wheels in fixed relationship against the rear wheel carrier and extending rearward beyond the vacuum cleaner rear support wheels terminating at an upwardly turned lip for depressing the rear wheels, such as by the operator's foot, to raise the rear end of the vacuum cleaner and pivotally lower the front cleaning nozzle, and wherein said lever extends forward and has formed therein an aperture for receipt therethrough of the rear wheel carrier fork attachment shaft and further includes a tab depending therefrom arranged to contact the vacuum cleaner body and prevent further lowering of the vacuum cleaner rear wheels beyond a desired point.

4,513,473

SEALED ROTARY MOTION DAMPER

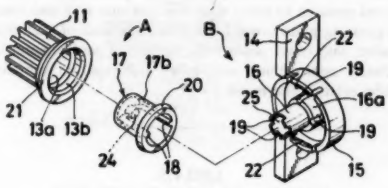
Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Dec. 16, 1983, Ser. No. 562,061

Claims priority, application Japan, Dec. 23, 1982, 57-193979[U]

Int. Cl.³ E05F *5/02*

U.S. Cl. 16—82 **4 Claims**



1. An oil type damper, comprising a rotor formed of a toothed wheel and a boss and provided with a hollow part coaxially formed in said toothed wheel and boss and opening at the end of said boss, a base seat incorporating a base for attachment to a given device and provided with a tubular part adapted to be fitted around the outer surface of said boss of said rotor and a shaft formed coaxially with respect to said tubular part and adapted to be inserted into said hollow part of said rotor, said tubular part and said shaft both being formed on said base, and a separate sealer element having the shape of a tube and having a closed end and an open end and being inserted into said hollow part of the rotor so as to define a space between the sealer element and said rotor wherein oil is contained in said space and said sealer element is provided at the open end with an annular flange that is in sealing contact with an inner surface of the open end of said hollow part of said rotor, one of said shaft of the base seat and said sealer element being provided with at least one recess and the other being provided with at least one projection to be matched to said recess so as to prevent rotation of said shaft of the base seat and said sealer element.

4,513,474

WEDGE HINGE HAVING AN AXIALLY MOVABLE PIVOT

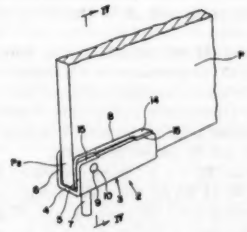
Takaharu Watabe, Hirakata, Japan, assignor to Santo Industries Co., Ltd., Osaka, Japan

Filed Nov. 15, 1982, Ser. No. 441,913

Claims priority, application Japan, Aug. 27, 1982, 57-129968; Aug. 27, 1982, 57-129969

Int. Cl.³ E05D *7/04*

U.S. Cl. 16—243 **8 Claims**



1. A hinge device comprising a main body in the form of a channel member having two parallel side walls and a web connecting said side walls, a mount pin projecting outward

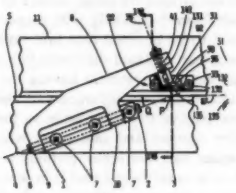
from said web, and a pressing plate having oppositely facing side surfaces, said pressing plate being connected adjacent to one of its ends to one of said side walls by an axially slidable pivot and being pivotally retractable into said channel member between said side walls, said pressing plate being provided with a wedge formation on the one of said side surfaces opposed to said one side wall, the other of said side surfaces of the pressing plates being planar and parallel to the other side wall of said channel member, said wedge formation being adapted in response to pivotal retraction of said pressing plate into said channel member to coact with said one side wall and translate said pressing plate toward the other side wall of said channel member, said other planar side surface of said pressing plate gradually approaching said other side wall in subtantially parallel relation therewith.

4,513,475

HINGES AND HINGED ARTICLES

Geoffrey J. Fenton, Sandfly, Australia, assignor to Magnetic Engineering Pty. Ltd., Australia

Filed Apr. 14, 1983, Ser. No. 485,067
Claims priority, application Australia, Apr. 14, 1982, PF3583
Int. Cl.³ E05D *3/10*
U.S. Cl. 16—360 **17 Claims**



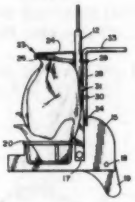
1. A hinged article comprising
first body (3),
second body (11),
hinge means interconnecting the first (3) and second (11) bodies and defining a hinge line (87)
and wherein the hinge means includes
a hinge which comprises
a first member (8) pivotally mounted to the first body (3) about a first pivot axis (4) which is inclined (Q) to the hinge line (87), and
a coupling (91, 92, 94) for articulating the first member (8) to the second body (11);
said coupling defining a second axis (39) fixed relative to the first member (8) such that a projection of the second axis (39) intersects a projection of the first axis (4),
said coupling (91, 92, 94) being arranged to lie entirely on one side of at least one plane passing through the intersection of the projections of the first (4) and second (39) axes, and
said coupling (91, 92, 94) additionally defining a third axis (88, 171, 17) fixed relative to the second body (11) about which the second axis (39) can pivot and which third axis (88, 171, 17) intersects a projection of the second axis (39) at a constant angle for all hinged orientations of the first body (3) and the second body (11),
the third axis (88, 171, 17) being defined by bearing surfaces (16, 18, 30, 31, 54, 58, 60) which extend on each side of a plane normal to the third axis (88, 171, 17) passing through the intersection of the projection of the second axis (39) and the third axis (88, 171, 17),
whereby loads borne, in use, by said coupling (91, 92, 94) will be distributed on each side of said plane normal to the third axis (88, 171, 17).

4,513,476

APPARATUS FOR PROCESSING POULTRY

Harold D. Olson, Smyrna; Charles Addison, Dunwoody, and J. Douglas Cagle, Roswell, all of Ga., assignors to Cagle's, Inc., Atlanta, Ga.

Filed Mar. 21, 1983, Ser. No. 477,269
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—44.1 **5 Claims**



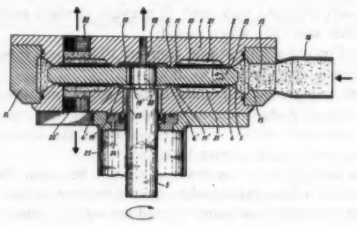
1. A shackle for conveying previously eviscerated, decapitated oven-ready poultry in a compact configuration comprising, in combination, an upright hanger bar; a basket sized and shaped to form a surface support for the carcass of a bird in an inverted attitude, said basket being pivotably mounted to a lower portion of said hanger bar for movement between a generally horizontal bird supporting raised position and a generally vertical bird-dumping lowered position; a canopy mounted to an upper portion of said hanger bar above said basket at a distance approximately corresponding to the length of the carcass of the bird for engaging the hocks of the bird and holding the thighs of the bird folded against the breast of the bird and holding an upper end of a bird supported upon the basket; and latch means for releaseably holding said basket in said raised position.

4,513,477

METHOD FOR REMOVING SOLID PARTICLES FROM A PASTY MASS

Gerardus H. J. Ketels, Grave, Netherlands, assignor to Procom, B.V., Oss, Netherlands

Division of Ser. No. 320,611, Nov. 12, 1981, Pat. No. 4,443,912. This application Nov. 7, 1983, Ser. No. 548,329
Claims priority, application Netherlands, Oct. 6, 1981, 8104544
Int. Cl.³ A22C *17/00*; B02C *18/20*; B02B *7/04*
U.S. Cl. 17—46 **3 Claims**



1. A method of separating solid particles such as bone particles from a fluid mass of particles such as meat particles comprising the steps of moving a mass of the combined particles along a path comprised of a channel having a width less than the length of the shortest solid particles to be removed for orienting the solid particles to be removed so that their long dimension extends generally in a plane parallel to the direction of movement along the path, separating the fluid particles from

the solid particles by permitting the fluid particles to escape from the path of movement in a direction generally perpendicular to the direction of movement of the mass along the path, at least a portion of said solid particles having a short dimension enabling them to pass radially outwardly with said fluid particles in the absence of said orientation and removing the solid particles at the end of the path.

4,513,478

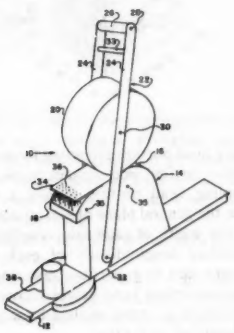
CRAB MEAT EXTRACTING DEVICE

Fred Trahan, Rte. 4, Box 225, Beaumont, Tex. 77705

Filed Apr. 14, 1983, Ser. No. 484,989

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—71 **6 Claims**



1. An apparatus for extracting meat from a crab including:
a base member;
a roller support member coupled to the base member;
a semi-circularly extending tracking surface formed on the roller support member;
a plurality of upwardly projecting members formed on the roller support member;
a roller pivotably mounted adjacent to the tracking surface on the roller support member; and
a plurality of downwardly projecting members mounted on the roller support member and in alignment with and spaced from the upwardly projecting members so that when the crab is placed in the space the roller can be pivoted to extract meat from the crab.

4,513,479

APPARATUS FOR OPENING TEXTILE FIBER BALES

Rolf Binder, Räterschen; Daniel Hanselmann, Oberwinterthur, and Walter Schlepfer, Winterthur, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jun. 18, 1984, Ser. No. 621,998

Claims priority, application Switzerland, Jun. 24, 1983, 3446/83

Int. Cl.³ D01G *7/06*

U.S. Cl. 19—80 R **10 Claims**

1. In an apparatus for opening textile fiber bales, comprising:
a fiber extraction element for extraction of fiber flocks from upper surface layers of a textile fiber bale;
a pneumatic transport duct arranged above the fiber extraction element for transporting away fiber flocks delivered thereto from the fiber extraction element;
a fiber diverting means extending over the length of the fiber extraction element and immediately adjacent thereto for guiding fiber flocks delivered from the fiber extraction element into the pneumatic transport duct; the improvement which comprises:
means mounting the fiber diverting means for enabling pivoting of said fiber diverting means out of the region in the immediate vicinity of the fiber extraction element when a

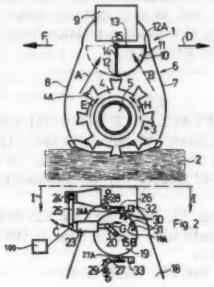


Fig. 2

disturbing foreign object undesirably acts upon the fiber diverting means.

4,513,480

CARD CLOTHING FOR CARDING FLATS

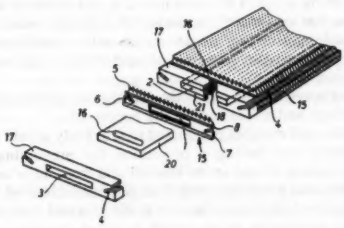
Werner Bisquolm, Siebnen; Jörg Bürki, Jona, and Othmar Teuscher, Mollis, all of Switzerland, assignors to Graf & Cie AG, Rapperswil, Switzerland

Filed Dec. 6, 1982, Ser. No. 447,274

Claims priority, application Switzerland, Apr. 16, 1982, 2331/82

Int. Cl.³ D01G *15/24*

U.S. Cl. 19—113 **3 Claims**



1. An improved card clothing for the flats of a carding machine, which card clothing comprises a plurality of mutually abutting wire sections arranged side by side and having a row of teeth and a foot section each, the improvement comprising an elongated carrier member on which said wire sections are lined up side by side in a mutually prestressed condition, which said carrier member is provided with locking members which clampingly hold said wire sections permanently at a prestressed condition locked on said carrier member, said every wire section further comprises a web section which extends between said row of teeth and said foot section and comprises further a distance piece section projecting from said web at a location intermediate said row of teeth and said foot section, further wherein said carrier member is an elongated profile and a through opening is provided in the web of every said wire section, and wherein said carrier member is provided at least at one end with a through opening intended for receiving a locking element of said locking member for said web sections, said through opening located at one end of said carrier member is an elongated opening which extends parallel to its face surface, said locking element is a block-like structure slid onto said carrier member and provided with a through opening, said through opening having dimensions corresponding to the dimensions of the through opening located in said

web of said wire sections, further wherein the height of said block-like structure equals the height of said web inclusive said foot and said distance piece section of said wire sections such that said block-like structure contacts the outermost wire section at said foot and at said distance piece section, and wherein said locking element is a plastically deformable section of said block-like structure.

4,513,481

EASILY DISPLACEABLE BOTTOM TENSER

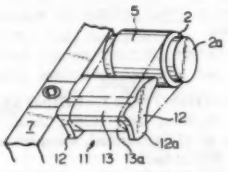
Yoshihisa Suzuki, Chiryu; Yoshiharu Yasui, Toyota; Kazuo Seiki, Kariya, and Shigeru Takasu, Nishio, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Aug. 17, 1983, Ser. No. 523,953

Claims priority, application Japan, Sep. 2, 1982, 57-151767; Sep. 8, 1982, 57-155111

Int. Cl.³ D01H *5/86*

U.S. Cl. 19—244 **10 Claims**



1. A tensioning device for tensioning an apron wrapped around a cantilever-mounted bottom roller of a drafting means in a spinning frame, said roller having an outer free end on one side from which said apron may be removed, said tensioning device being adapted to be mounted in juxtaposition with said roller so that said apron may be installed on and removed from said tensioning device on an access side of said tensioning device adjacent the free end of said roller, said tensioning device comprising:

a cantilever-mountable body having an apron-supporting surface and a free end on the access side;

a guide wall member connected to said body at said free end thereof and having a projection for preventing lateral movement of said apron toward said free end of said body when said projection is in a usage position, said guide wall member being movable with respect to said body to move said projection to an apron removal position so as to permit lateral movement of said apron over said free end of said body; and

connecting means for mechanically locking said guide wall member to said body to prevent movement of said guide wall member laterally of said body when said projection is in said usage position,

said connecting means permitting movement of said guide wall member relative to said body, to said apron removal position wherein said apron may be removed from or installed on the free end of said tensioning device.

4,513,482

FLUID-TIGHT SLIDE FASTENER STRINGER

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 410,130, Aug. 20, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 603,988

Claims priority, application Japan, Aug. 20, 1981, 56-129440

Int. Cl.³ A44B *19/00*

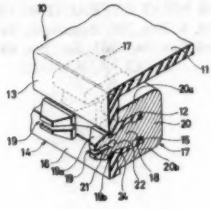
U.S. Cl. 24—384 **7 Claims**

1. A fluid-tight slide fastener stringer comprising:

(a) a support tape made of a fluid-tight soft material and having a longitudinal edge portion folded so as to provide therealong a contact portion adapted to engage a corresponding contact portion of a like companion stringer to effect a fluid-tightness between such two stringers; and

(b) a row of discrete coupling elements mounted on and along the folded edge portion of said tape, each of said coupling elements having

(1) a base portion disposed on an outer surface of said folded tape edge portion and extending transversely thereof, and



(2) a coupling head portion extending from one end of said base portion beyond said contact portion of said tape, said coupling head portion having a slot extending parallel to the general plane of said stringer transversely through the width of each said coupling element and also extending longitudinally of each said coupling element into said base portion, said slot defining first and second coupling head halves recoverably deformable in response to stress applied by a mating stringer independently of each other.

4,513,483

SLIDE FASTENER STRINGER

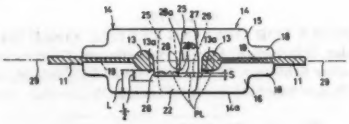
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,116

Claims priority, application Japan, Dec. 13, 1982, 57-188379[U]

Int. Cl.³ A44F *19/04*

U.S. Cl. 24—409 **7 Claims**



1. A slide fastener stringer comprising:

(a) a stringer tape having a longitudinal edge portion;

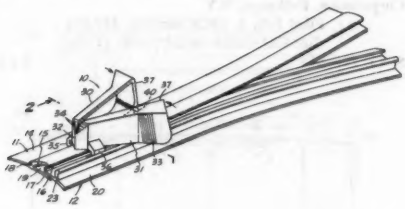
(b) a series of uniformly spaced coupling elements mounted on and along said longitudinal edge portion, each said coupling element including a pair of legs disposed astride said longitudinal edge portion, and a coupling projection extending from said legs away from said tape beyond said longitudinal edge portion; and

(c) said coupling projection having a pair of integral superposed first and second coupling portions having different shapes and respectively engageable with second and first coupling portions of a pair of adjacent coupling elements on a co-operating like stringer, said first portion extending from one side of said stringer tape toward the other side beyond the thickness of said longitudinal edge portion.

4,513,484
SEAM CLOSURE DEVICE

Jackson R. Iblings, Encino, Calif., assignor to Walter Allen Plummer, III, Tustin, Calif.

Filed Dec. 12, 1983, Ser. No. 560,497
Int. Cl.³ A44B 19/00
U.S. Cl. 24—437 18 Claims



1. A seam closure device for progressively closing a pair of seam members each having a V-shaped portion extending lengthwise thereof sized and shaped for internesting assembly as one of said V-shaped portions seats behind an inturned hook on one leg of the other one of said V-shaped portions, said closure device comprising:

a pair of elongated finger grip members pivotally interconnected at one end;

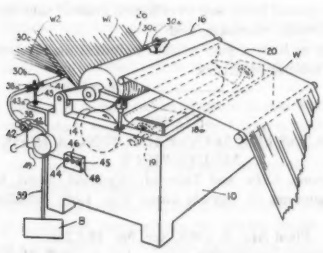
hook-like means facing toward one another from a respective one of the finger grip members adjacent said one end thereof and constructed to straddle the V-shaped portions of said seam members from one side thereof with one of said hook-like means seated against the interior apex of the smaller V-shaped portion and the other of said hook-like means seated against the exterior apex of the larger V-shaped portion; and

said finger grip members being pivotable toward one another and thereby operable to force said V-shaped portions progressively into internested assembly as said device is advanced along said seam members.

4,513,485
METHOD FOR SPLITTING TEXTILE WARP YARN SHEETS

William H. Cutts, P.O. Box 748, Clemson, S.C. 29631, and Scott O. Seydel, 80 Broad St., NW., Atlanta, Ga. 30303

Filed Oct. 5, 1981, Ser. No. 308,449
Int. Cl.³ D06B 1/14, 1/16
U.S. Cl. 28—181 12 Claims



1. In a method of treating warp yarns preparatory to weaving on a loom of the type wherein a sizing solution is applied to the yarns arranged generally side-by-side in sheet form on a slashing machine followed by passing said yarns over a lease rod after application of said sizing solution splitting same into a pair of sheets defining a shed therebetween and subjecting said yarns to a drying process, the improvement comprising:

providing a hollow split lease rod including an outer porous layer having an exterior porous yarn contacting surface defined by a minute cellular pore structure so that substantially the entire yarn contacting surface of said lease rod is uniformly wetted to avoid sticking of said yarns without excessively lubricating said yarns;

placing said split rod in said shed;

splitting said yarns into said sheets by contacting said yarns with said porous yarn contacting surface; and

supplying a lubricant to said porous layer at a sufficient pressure to cause said lubricant to sweat through said layer and wet said yarn contacting surface by a predetermined amount sufficient to uniformly wet said porous yarn contacting surfaces to avoid said sticking of said yarns thereagainst.

7. A method of treating warp yarns in preparation for weaving said yarns on a loom of the type wherein a sizing solution is applied to the yarns arranged generally side-by-side in sheet form on a slashing machine followed by passing the yarns over at least one lease rod after application of said sizing solution to split the yarn sheet into a plurality of separated yarn sheets and then subjecting the yarns to a drying process, wherein the improvement comprises:

providing said lease rod having a porous outer layer and exterior yarn contacting surface defined by a minute cellular pore structure and a fluid communicating interior portion;

providing said porous exterior surface continuously over said yarn contacting surface corresponding generally to the entire width of said yarn sheets so that all of said yarns are prevented from sticking essentially continuously over said entire yarn contacting surface;

providing a source of fluid communicating with said interior portion; and

pressurizing said fluid to maintain fluid flow by sweating through said porous layer of sufficient quantity to form a fluid layer on said yarn contacting surface and prevent sticking of said sizing solution to said yarn contacting surface without excessive application of said fluid to said yarns.

4,513,486
VALVE RETAINER FOR AUTOMOTIVE VALVE REPAIR

Mieczyslaw J. Raczek, 159 Skyview Way, San Francisco, Calif. 94131

Filed Aug. 5, 1983, Ser. No. 520,716
Int. Cl.³ B23P 19/04
U.S. Cl. 29—220 5 Claims

1. A device for facilitating the repair of automotive cylinder valves comprising:

an elongated tool of generally cylindrical configuration, said tool comprising:

a first hollow cylindrical housing having a first threaded end disposed for threading into a spark plug opening of an automotive cylinder head;

a second hollow cylindrical housing concentric with said first housing having a first end disposed for positioning against the outer surface of said cylinder head;

hand operated knobs fixedly positioned on the second end of said housings;

a cylindrical shaft slidably positioned within said first housing engaging threaded means within said housing and disposed to penetrate into the interior of said cylinder;

a knob fixedly positioned on a first end of said shaft disposed for rotating said shaft thereby imparting longitudinal motion thereto;

a two-bar linkage mechanism engaging a second end of said shaft;

a hinged arm forming one link of said mechanism,

whereby, upward movement of said shaft causes rotation of said arm in a vertical plane;

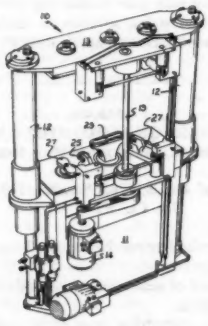
the other end of said arm being disposed to engage the under side of a valve in said cylinder head.

4,513,487

SEAMING MACHINE FOR MUFFLERS

Kevin D. Binnie, Taren Point, Australia, assignor to K. D. Binnie Engineering Pty. Ltd., New South Wales, Australia

Filed Aug. 2, 1983, Ser. No. 519,558
Claims priority, application Australia, Aug. 4, 1982, PF5209
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—243.5 **5 Claims**



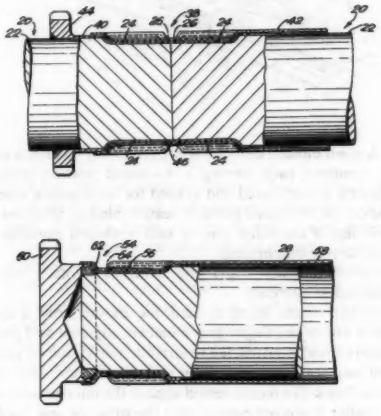
1. An apparatus to manufacture a metal casing having a side wall and end plate secured thereto by a seam joining the periphery of the end plate to an edge portion of the side wall, said apparatus comprising a base, a rotatable support mounted on the base and adapted to receive said end plate with said edge portion in abutting relationship with the periphery of said end plate, a pair of metal deforming assemblies also mounted the said base and spaced on opposite sides of said support; each assembly including a metal deforming roller to be moved into contact with said end plate and edge portion so as to deform same in co-operation with said support to form said seam, a cam rotatable about a fixed axis and having a cam profile, a movably mounted rotatable cam follower to engage said profile, said follower being operatively coupled to said deforming roller so that said deforming roller is moved in accordance with the cam profile in a direction towards said support, drive means to rotate the support and each cam in synchronism; and wherein each follower and its associated roller are located between the support and their associated cam and have a common support means movably mounting them on said base.

4,513,488

METHOD OF FABRICATING A TORQUE JOINT

Aldo Arena, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 8, 1982, Ser. No. 347,074
Int. Cl.³ B21D *39/00*; **B23P** *11/00*
U.S. Cl. 29—516 **3 Claims**



1. A method of fabricating a torque joint between two tubular members comprising the steps:

inserting an end of one tubular member, the inner member, into an end of the other tubular member, the outer member, to form an overlay region between said inner and outer tubular members;

forming a set of circumferential and axial grooves in a mandrel means, said circumferential groove being defined by reduced cooperating portions at the end of separable parts of the mandrel means;

inserting said mandrel means within said region of overlap between said inner and outer tubular members;

applying a deformation force to the exterior surface of said tubular members at a point opposite said mandrel means to impress said pattern of grooves of said mandrel means upon said inner and outer tubular members in said overlap region spaced from said overlapped ends of said inner and outer tubular members; and

extracting at least a part of said mandrel means from said joined tubular members.

4,513,489

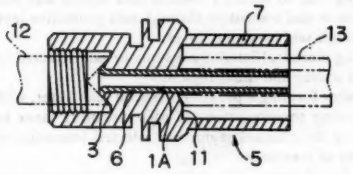
PROCESS FOR MANUFACTURING A HOSE MOUTHPIECE

Kenji Sugiyama, Gifu, and Takeshi Miyazaki, Aichi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 5, 1983, Ser. No. 482,282
Claims priority, application Japan, Apr. 6, 1982, 57-57550
Int. Cl.³ B21D *39/00*; **B23P** *11/00*
U.S. Cl. 29—520 **2 Claims**

1. In a process for manufacturing a hose mouthpiece by joining a nipple, made of hard but somewhat elastic deformable material such as steel, to a mouthpiece body made of a similar material having a nipple holding hole, the improvement which comprises:

inserting said nipple having a radially outwardly spread end into said hole at one end thereof around which an externally frusto-conical first seat surface having a chamfered inner edge is formed on said body, until said spread end abuts on said seat surface, while the other end of said nipple projects outwardly from the other end of said hole;



press forming said spread end so that it may become flush with said seat surface; and

crimping a second seat surface about said nipple, said second seat surface being provided on said body and encircling said other end of said hole to define a seat for one end of a hose, whereby said nipple is secured to said body.

4,513,490

INTERMEDIATE ACCUMULATING SYSTEM IN PROCESSING STRIP MATERIAL

Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720

Continuation of Ser. No. 162,681, Jun. 25, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,067

Int. Cl.³ B22D *11/126;* **E05B** *9/04;* **B21C** *47/02*

U.S. Cl. 29—527.6 **2 Claims**

1. The method of manufacturing metallic strip material by the passage thereof through a series of processing facilities prior to the coiling thereof upon exiting from the final processing facility, which comprises

(a) feeding the strip material into a high capacity spiral loop accumulator, whose entry and exit velocities are independently controllable, before said final facility and coiling of the strip material,

(b) feeding strip material in advance of said final facility into intermediate high capacity spiral loop accumulators, each in advance of an intermediate processing facility, with the entry and exit velocities of each accumulator being independently controllable,

(c) selectively connecting the strip material from the output of a selected intermediate processing facility to the input of a following intermediate processing facility,

(d) ultimately connecting the strip material from the output of any intermediate processing facility to the tail end of the strip at the entry end of the first-mentioned accumulator supplying the strip material to said final facility, and

(e) transporting the strip material between said facilities, for the major part of its travel, in a nearly vertical upright attitude.

4,513,491

METHOD OF ROLLING WIDE STRIP STARTING MATERIAL

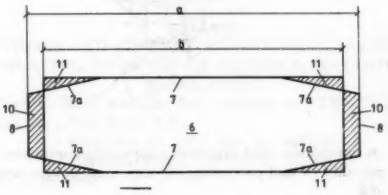
Heinrich Bohnenkamp, Neuss-Uedesheim, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,079

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225313

Int. Cl.³ B22D *11/126*

U.S. Cl. 29—527.7 **2 Claims**



1. A method of rolling wide strip starting material, in which an ingot slab is rolled approximately to the desired wide strip width by having its shorter sides edge-rolled, characterized by the steps of providing an ingot slab with a cross-section tapered towards the shorter sides of the slab at both edges, and edge-rolling the slab thereby reducing the slab width and causing the edge regions of the slab to adopt a rectangular shape by displacement of material from the slab edges to regions adjoining the initially tapered regions of the slab.

4,513,492

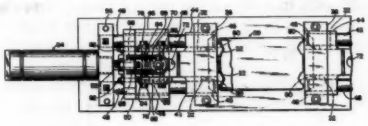
APPARATUS FOR FORMING CABLE ENTRY PORT

Gunter A. Gallas, New Hyde Park, N.Y., assignor to Slater Electric, Inc., Glen Cove, N.Y.

Division of Ser. No. 200,422, Oct. 24, 1980,. This application Mar. 28, 1983, Ser. No. 479,550

Int. Cl.³ B23P *23/00*

U.S. Cl. 29—564.7 **6 Claims**



1. Apparatus for pre-fracturing the webs of closure means for cable-entry ports in molded electrical outlet boxes, comprising:

a ram-like member having an edge for penetrating the web;

means for advancing said ram-like member towards the web; and

locating means including ramp means for maintaining the box in desired position to thereby center the web under the ram edge during advance of the ram-like member, said locating means being associated with said advancing means to engage the outlet box directly in conjunction with the advancing of said ram-like member,

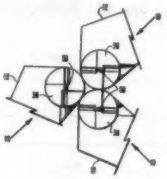
such that the closure means retain sufficient residual strength to withstand industry impact and other standards for closure of cable-entry ports.

4,513,493

COMPONENT LEAD PROCESSING DEVICE

George J. Whitley, Philadelphia, Pa., and Martin Rayl, Lawrenceville, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 14, 1981, Ser. No. 302,294
Int. Cl.³ B23P *19/00*; H05K *3/30*
U.S. Cl. 29—566.3 **15 Claims**



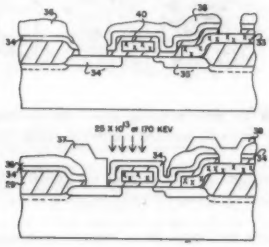
1. A component lead processing apparatus comprising:
a plurality of lead processing devices, each device comprising:
a support body;
a lead processing head rotatably mounted in said body for processing said component leads when the head is rotated about a given axis; and
actuating means secured to said body for operating said processing head to cause said head to rotate and process said leads, said head having an outer surface extending in a given radial direction with respect to said axis a first distance, said body extending in the same radial direction as said given radial direction from said axis a second distance substantially no greater than said first distance in a given angular segment about said axis, said actuating means extending in the same radial direction as said given radial direction a third distance substantially no greater than said first distance in said angular segment; and
means for locating said plurality of devices with at least a pair of said heads contiguous at said outer surface within said angular segment.

4,513,494

LATE MASK PROCESS FOR PROGRAMMING READ ONLY MEMORIES

Tarsaim Batra, Cupertino, Calif., assignor to American Microsystems, Incorporated, Santa Clara, Calif.

Filed Jul. 19, 1983, Ser. No. 516,064
Int. Cl.³ H01L *21/265*; B01J *17/00*
U.S. Cl. 29—576 B **14 Claims**



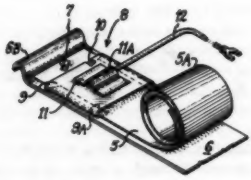
1. A process for producing a custom programmed read-only memory (ROM) in a semiconductor wafer, comprising:
fabricating in said wafer an array of MOS transistors, said MOS transistors being fabricated up to the stage of contact formation, each said MOS transistor having a source region, a drain region spaced apart from said source region, a channel region located between said source and drain region, and a gate located above and insulated from said channel region;
forming a protective layer over said MOS transistors;
forming an insulating layer over said protective layer, said insulating layer being of a thickness sufficient to absorb ions which are subsequently implanted;
forming vias to selected ones of said source and drain regions in said transistors through said protective layer and through said insulating layer;
forming electrical interconnections to said selected ones of said source and drain regions;
thereafter forming a program mask on said wafer, said mask exposing those portions of said insulating layer located above the channel regions of selected transistors in said array of transistors;
removing the exposed portions of said insulating layer to expose said protective layer; and
implanting ions through said protective layer into said channel regions of said selected transistors to alter the threshold voltages of said selected transistors, the remaining portions of said insulating layer serving to stop passage of said ions.

4,513,495

CONTACT AND TERMINAL ASSEMBLY FOR A BRUSH WEAR INDICATOR

Dan W. Kimberlin, Erie, Pa., assignor to General Electric Company, Salem, Va.

Division of Ser. No. 382,034, May 26, 1982, Pat. No. 4,420,705.
This application Sep. 22, 1983, Ser. No. 534,688
Int. Cl.³ H02K *13/10*; H01R *43/14*
U.S. Cl. 29—597 **4 Claims**



1. A method of making a brush wear indicator contact and terminal assembly comprising the steps of providing a self-winding, brush-follower spring, forming a contact plate of electrically conductive material so that a ridge is formed on one surface of the plate and a groove is formed in an opposite surface thereof, positioning a conductor for a brush wear indicator circuit within said groove, bonding the conductor to the walls of the groove with a high-temperature resistant bonding material, subsequently bonding the contact plate to a first surface of a dielectric sheet, and adhering a second surface of the dielectric sheet to a predetermined portion of the brush-follower spring, thereby to mount the contact plate and the dielectric sheet in a desired fixed relationship to the spring where a coiled portion of the spring is effective to engage the ridge on the plate as a contactor, thereby to energize a brush wear indicating signal connected to said conductor, said desired fixed relationship being determined to correspond with the occurrence of a predetermined degree of wear of a brush operated in association with the contact and terminal assembly.

4,513,496

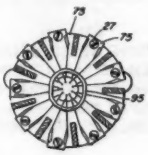
METHOD OF MAKING A PRINT PIN ACTUATOR

Cheng-hua Wang, Nashua, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Continuation-in-part of Ser. No. 458,306, Jan. 17, 1983, abandoned. This application Oct. 7, 1983, Ser. No. 540,043

Int. Cl.³ H01F *7/06*

U.S. Cl. 29—606 **3 Claims**



1. A method of fabricating a high speed pin actuator for dot matrix printing which comprises:

providing a permeable core structure which is generally U-shaped with one leg of the U being shorter than the other, the end of the other leg constituting a pole piece;

mounting a permanent magnet on said shorter leg and a permeable plate over said magnet which together make the length of said one leg substantially equal to the length of the pole piece leg;

finishing the end of the pole piece leg and said plate together to form a common plane;

providing a permeable bridge member which has a flat surface adapted to mate with said plate and which is adapted to extend therefrom to a region adjacent the pole piece, said bridge member being bifurcated generally in the plane of the U-shaped core structure;

mounting to said bridge structure, on the side opposite said flat surface, a plate-like spring, the rest position of said spring being generally parallel to said flat surface, said spring carrying an armature adapted to extend through the bifurcation in the bridge structure;

deflecting said spring an amount corresponding to the desired throw of a printing pin;

while said spring is so deflected, finishing the portion of the armature extending through said bifurcation to a common plane with said flat surface;

mounting a coil on said core, a printing pin on said spring, and said bridge on said U-shaped magnet structure, thereby forming an actuator assembly.

4,513,497

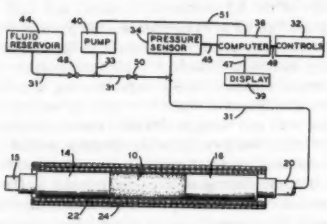
TUBE EXPANDING SYSTEM

Curtis L. Finch, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 445,609, Nov. 30, 1982, abandoned, which is a continuation of Ser. No. 156,543, Jun. 5, 1980, abandoned. This application Sep. 27, 1984, Ser. No. 655,985

Int. Cl.³ B23P *15/26;* **B21D** *39/08*

U.S. Cl. 29—727 **18 Claims**



1. A tube expanding system comprising: a hydraulic tube expander including distensible bladder means positionable within a tube; pump means for pressurizing fluid within said bladder means; means for monitoring changes in the fluid pressure within said bladder means; and means for detecting from the monitored pressure changes a decrease in the rate of fluid pressure increase, as a function of incremental action of said pump means, indicative that the yield point of the tube is reached whereby the increase in outside diameter of a tube within which a sleeve is expanded may be accurately limited by ceasing pressurizing of fluid within the bladder means when the yield point of the tube is reached.

4,513,498

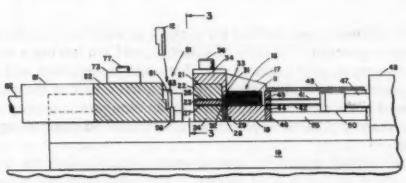
METHODS AND APPARATUS FOR SIMULTANEOUSLY INSERTING AN ARRAY OF FLEXIBLE PINS INTO A WORK PIECE

William C. Kent, Garland, Tex., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,611

Int. Cl.³ H05K *3/00;* **B23P** *19/04*

U.S. Cl. 29—845 **11 Claims**



1. An apparatus for inserting a row of pins into a row of holes formed in a work piece comprising:

a loader block having a first and a second surface with a row of passageways formed therein between said surfaces, said passageways being spaced apart distances equal to the distance between the holes in the work piece and having lengths less than the lengths of the pins;

a plurality of bins located on the first surface side of the block and aligned with the row of passageways for receiving stacks of pins;

a plurality of first pusher rods located adjacent to said bins and arrayed in a row with spaced apart distances equal to the spacings between the passageways, said pusher rods being mounted in alignment with individual pins in the respective bins;

a work holder located on the second surface side of the block and having a nest for receiving the work piece and positioning the holes in the work piece in alignment with the passageways;

means coupled to the pusher rods for reciprocating them to engage and move pins from the individual stacks into the passageways;

means located between the loader block and the bins and operated upon retraction of the pusher rods for closing the entries to passageways in said loader block; and

means coupled to the work holder for advancing it toward the loader block to seat the pins within the holes formed in the work piece.

8. A method of seating an array of spaced pins into a like array of holes formed in an article, which comprises:

supporting supplies of pins in stacks corresponding to the spacing of the holes in the article and with the lowermost pin of each stack aligned with a hole formed in the article;

picking off the lowermost pin in each stack and axially advancing the pins into an array of passageways corresponding to the array of holes formed in the article, said advancing step being sufficient to position the trailing extremities of the pins within said passageways and the

forward extremities of the pins projecting from the passageways;

blocking the passageways to prevent the trailing extremities of the pins from being pushed from the passageways; and

advancing the article to move said holes onto the projecting forward extremities of said pins while said pins are blocked from movement from said passageways.

4,513,499

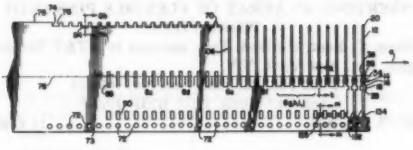
METHOD OF MAKING COMPLIANT PINS

Frank Roldan, 937 Paularino Ave., Costa Mesa, Calif. 92626

Filed Nov. 15, 1982, Ser. No. 441,405

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—874 **3 Claims**



1. An improved method for making an electrical contact pin from a generally flat strip of material, said pin having a shoulder segment, post segment, and, between the shoulder and post segments, a compliant segment which has a pair of outwardly biased beam members separated by an elongated opening having sharply pointed opposed ends, said method comprising the steps of:

(a) cutting generally spaced-apart aligned windows in the strip so that a solid section is provided between adjacent pairs of windows, the compliant segment of said pin being formed from this solid section;

(b) severing the solid section generally at right angles with respect to the longitudinal axis of the strip to form in the solid section a pair of metal pieces from which the beam members are made, one of said pieces moving in one direction away from the plane of the strip and the other piece moving in the opposite direction away from the plane of the strip;

(c) pressing the pair of metal pieces together so that they return to the plane of the strip and coining the edges of each metal piece furtherest from the severed interface;

(d) twisting the metal pieces to provide a generally V-shaped entryway between the severed interface of the pieces;

(e) inserting a first spreading element to move the metal pieces at a right angle to the plane of the strip to form the opening in the compliant section while coining the upper edges of the severed interface;

(f) inserting a second spreading element in an opposite direction from the insertion of the first spreading element to further coin the lower edges of the severed interface, and

(g) forming from the strip, integral with the metal pieces, the shoulder and post segments of this pin.

4,513,500

METHOD OF FORMING A WIRE SPLICE

Frank W. Knapp, and Caroline M. Knapp, both of Box 289, Mineral Point, Wis. 53565

Filed Nov. 14, 1983, Ser. No. 551,676

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—885 **6 Claims**

1. The method of producing sleeves or ferrules for joining a pair of wires together comprising:

(a) taking a piece of cold rolled and drawn steel tubing having a specific outer diameter and a specific inner diameter;

(b) then deburring each end and threading the inside of each sleeve;

(c) then forming each sleeve into an oval shape;

(d) then heat treating each sleeve;

(e) then zinc plating each piece, and then coating each sleeve with an olive drab chromium finish.

4,513,501

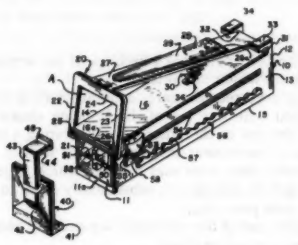
COMBINED STORING AND SLICING DEVICE FOR A STICK OF BUTTER OR MARGARINE OR THE LIKE

Jong S. Lee, 800 Forest Ave., Westfield, N.J. 07090

Filed Feb. 14, 1983, Ser. No. 466,163

Int. Cl.³ A01J *19/00*

U.S. Cl. 30—115 **8 Claims**



1. A combined storing and slicing device comprising:

a rectangular box-like container having a top, a bottom, two longer sides, a closed shorter side and an open shorter side through which a stick of butter or the like is received;

a cutting line and means holding the line in a taut condition; and

means mounting the holding means for movement of the cutting line between a first fast rest position at the top of the open side and a second position at the bottom of the open side while traversing the open side, said mounting means comprising an arm pivotally engaged at one end thereof to the top wall of the container at the closed shorter side and a spring biasing the arm upwardly and the cutting line against the peripheral wall of the said open shorter side.

4,513,502

BEVERAGE LID CUTTER

John J. Gacek, 292 Hendrick Ave., Albany, N.Y. 12204

Filed Feb. 28, 1983, Ser. No. 470,775

Int. Cl.³ B26D *7/01*; B26F *1/12*

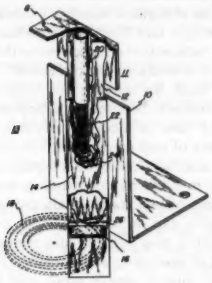
U.S. Cl. 30—229 **13 Claims**

1. A beverage lid cutter comprising:

a housing defining a plunger channel having at least one cutting wall and containing a slot transverse to the channel, said slot being configured so as to permit the insertion of a lid to a predetermined depth, thereby exposing a portion of the lid within the channel, and said slot also being configured so as to maintain the plane of the lid in a transverse orientation with respect to the channel;

a cutting assembly including a plunger slidably mounted within the channel, said plunger having a cutting edge with a configuration similar to that of the at least one cutting wall and being in slideable contact therewith, and said plunger being reciprocally operable within the channel between a retracted position and an advanced position such that the cutting edge passes the slot as the plunger moves from its retracted position to its advanced position, whereby the exposed portion of the lid inserted in the slot while the plunger is retracted will be removed as the plunger is moved to its advanced position, wherein the

cutting assembly is mounted within the channel by means of a guidebar mounted axially within the channel; and



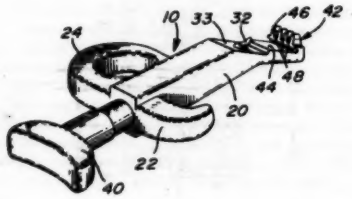
a sleeve rigidly connected to the cutting assembly, said sleeve being adapted to permit cooperative reciprocal movement of the plunger with respect to the guidebar.

4,513,503

WIRE CUTTING TOOL

Paul Tremblay, Montreal, Canada, assignor to Tekna Limited, Montreal, Canada

Filed Feb. 22, 1983, Ser. No. 468,709
Int. Cl.³ B26B *29/00*
U.S. Cl. 30—289 **14 Claims**



1. In combination, a connector block and a tool for cutting wires having portions embedded in the connector block and portions extending from at least one face of the connector block, said tool comprising:

an elongated hollow housing;

a plunger reciprocatingly mounted in said housing, said plunger having a cutting end at one extremity thereof;

anvil means mounted at one end of said housing, said anvil means including an inclined block-receiving portion making an acute angle with the longitudinal axis of said housing and for receiving said connector block thereon with said face in inclined facing relationship with the cutting end of said plunger, said block-receiving portion having a block resting surface and a block abutting surface extending orthogonally to said block resting surface wherein said block abutting surface includes in the upper part thereof, a series of grooves to receive therein wires extending from an opposite face of said block; and

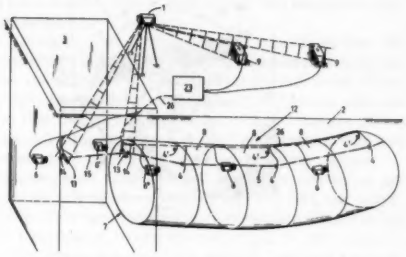
means for engaging the opposite extremity of said plunger and for forcing said cutting end in said block at a wire extending location on said face so that said cutting end penetrates said block underneath said wire to cut said wire at a distance inwardly of said face so as to leave the cut extremity of said wire portion in said block, recessed from said face.

4,513,504

METHOD FOR DETERMINING THE POSITION OF A PRESSED-AHEAD HOLLOW-SECTION LINE, AND APPARATUS FOR IMPLEMENTING THE METHOD

Manfred Nussbaumer, Leonberg; Eberhard Beitinger, Stuttgart, and Wolfgang Möhlenbrink, Esslingen, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,082
Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120010
Int. Cl.³ G01B *11/27*
U.S. Cl. 33—1 H **3 Claims**



1. In a method for determination of position of a pressed-ahead hollow-section line which can provide spatial three-dimensional contortion therewith, the steps comprising:

in the hollow-section line, providing an arrangement of fixed measuring points with spacing from each other;

moving the measuring points along in the pressed-ahead direction with the hollow-section line;

distributing the measuring points over the entire length of the hollow-section line;

in the longitudinal direction of the hollow-section line, fixedly arranging several automatic sensing-detection devices in series over the entire length thereof and also moving these devices along the hollow-section line in the pressed-ahead direction;

determining the spatial three-dimensional position of the measuring points relative to each other via the sensing-detection devices;

in the longitudinal direction of the hollow-section line, measuring the distances of the sensing-detection devices to the respectively next sensing-detection device and the distances of the measuring points to the respectively next measuring point;

from the output signals of the sensing-detection devices and the measured distances, calculating a closed distance line, extending over the entire length of the hollow-section line and thereby determining the position of the hollow-section line.

4,513,505

DEVICE FOR INDICATING THE POLAR COORDINATE POSITION OF A GIVEN POINT ANYWHERE WITHIN A CIRCULAR AREA

William C. Young, Moorestown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1983, Ser. No. 562,517
Int. Cl.³ G01B *3/00*
U.S. Cl. 33—1 MP **9 Claims**

1. A device for indicating the polar coordinate position of a point within a given area lying within a plane comprising:

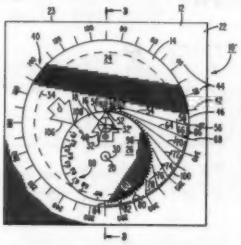
a member including means bounding said area and having angular scalar indicia thereon circumscribing said area;

a first element rotatably secured to said member for rotation about a first axis at the origin of said angular scalar indicia

normal to said plane, a portion of said first element of a given angular extent being adjacent said scalar indicia;

a second element rotatably secured to said first element for rotation about a second axis spaced from and parallel to said first axis, said second axis rotating with said first element about said first axis; and

said second element including first and second indicia, said first indicia representing the location of said point, said first element including third and fourth indicia, said third indicia being positioned and formed on said first element to couple said first indicia to said scalar indicia for indicat-



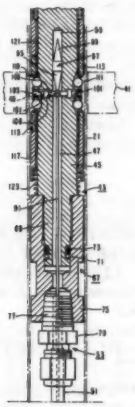
ing the angular location of said point with respect to a reference point coincident with said first axis, said second and fourth indicia being positioned and arranged to provide radial reference indicia on one of said elements aligned with radial displacement scalar indicia on the other of said elements to indicate the value of the relative radial displacement of said given point with respect to said reference point at said angular location, said radial displacement scalar indicia having an extent representing the maximum radial displacement of said given point from said reference point.

4,513,506

MEASURING OF TUBE EXPANSION

John P. Vogeleer, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1983, Ser. No. 522,290
Int. Cl.[3] G01B *13/10, 5/12*
U.S. Cl. 33—147 K **15 Claims**



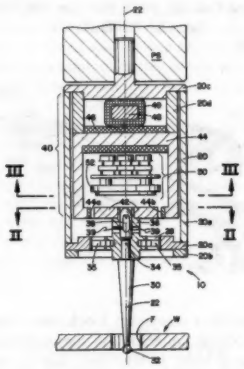
1. Apparatus for expanding a tube conducting the coolant from a nuclear reactor of the steam generator of a nuclear reactor plant, or a sleeve within a tube, the said apparatus including a tube-expansion mandrel to be disposed within said tube or sleeve and having a channel for conducting fluid under high pressure to expand said tube or sleeve, an elongated fluid-feed conductor, connected to said mandrel to supply said fluid to said channel, an elongated member extending through said mandrel and through said fluid-feed conductor to a position remote from the radioactive atmosphere within said generator, means, connected to said elongated member, responsive to the pressure of said fluid, for moving said member outwardly of said conductor, means to be interposed between said elongated member and said tube or sleeve, moveable by said moving means transversely of said member into engagement with said tube or sleeve as said tube or sleeve is expanded, the movement of said elongated member by said moving means to be limited by the engagement of said transversely moveable means with said tube or sleeve, and indicating means, connected to said elongated member at said position and responsive to the outward movement of said elongated member, for indicating the expansion of said tube or sleeve while said tube or sleeve is being expanded whereby the expansion of said tube or sleeve can be controlled.

4,513,507

CONTACT SENSING PROBE FOR A MEASURING APPARATUS

Edward L. Laskowski, Seven Hills, Ohio, assignor to Bendix Automation Company, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,827
Int. Cl.[3] G01B *11/24*
U.S. Cl. 33—169 R **8 Claims**



1. A probe for contacting a workpiece for inspection and measuring comprising:

a body;

a stylus mounted with said body for pivoting movement and including a stylus tip for engaging a workpiece, a medial mounting of said stylus to said body allowing movement therebetween;

a source of light mounted within said body;

means for detecting the light from the light source,

said light source and detecting means mounted to cause a variation in light incident on said detector means with pivoting movement of said stylus and for thereby indicating the position of the stylus tip, said detecting means including:

a plurality of photoelectric sensors mounted to the body;

detecting circuit disposed within said body and coupled to said photoelectric detectors and detecting changes in the amount of light from the individual photodetector sensors as an indication of stylus tip displacement;

summing means operatively connected to said plurality of sensors and summing the total intensity of light incident

on said plurality of photoelectric sensors and producing a corresponding signal;

a constant value reference signal source;

comparison means comparing said signal of said summing means and said reference signal source and generating a feedback signal corresponding to any differences therebetween; and

means mounted within said body and operatively connected to said light source and responsive to said comparison means to vary the output of said light source so as to control the total intensity of light incident on the sensors to be effectively constant.

4,513,508

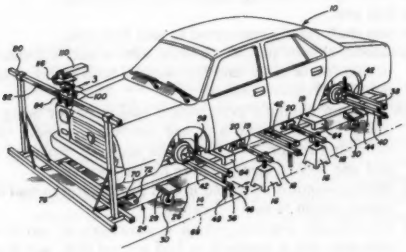
VEHICLE BODY AND FRAME MEASURING DEVICE

Davis R. Jarman, 612 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks Dr., both of Brunswick, Ga. 31520

Filed Nov. 9, 1983, Ser. No. 550,088

Int. Cl.³ G01B *11/26*

U.S. Cl. 33—288 **9 Claims**



8. In combination with a horizontal support bar positionable normal to a center vertical longitudinal plane of a stationarily supported vehicle body and wherein said bar includes linear scale means extending in opposite longitudinal directions along said bar from a center point thereon through which said plane passes, a light beam generating head, a follower mounted on said bar for adjustable positioning therealong, means mounting said head from said follower for adjusted and predetermined angular displacement relative to said follower about a first axis paralleling said bar and a second axis disposed normal to the first axis.

4,513,509

ATTITUDE DIRECTOR INDICATOR

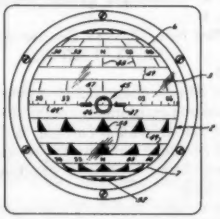
Lennart Nordström, Linköping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Jan. 5, 1984, Ser. No. 568,538

Claims priority, application Sweden, Jan. 7, 1983, 8300065

Int. Cl.³ G01C *19/44;* **G08C** *21/00*

U.S. Cl. 33—330 **7 Claims**



1. An instrument carried in an aircraft for displaying the attitude of the aircraft about its pitch and roll axes, said instrument being of the type having a gyro controlled spherical display on which there are delineations of regularly spaced meridians that maintain a vertical orientation relative to the earth and spaced parallels transverse to the meridians, one of which is an equator that divides the sphere into upper and lower hemispheres and corresponds to a horizon, said instrument further comprising indicator means relatively fixed with respect to the aircraft and substantially centered on said display delineating a reference that relates the attitude of the aircraft to said meridians and parallels, said instrument being characterized by:

a plurality of pointer indicia on the lower one of said hemispheres, at least one for each of said meridians, each having a pointing apex, each said indicium

(1) being symmetrical to its meridian with its apex on that meridian and

(2) having its apex proximal to said equator, so that the one of said indicia that is nearest said reference provides an unambiguous and self-explanatory indication of the "up" direction relative to the earth, and indicia adjacent to that one provide information about changes of the aircraft attitude relative to that "up" direction that will result from possible changes in its existing attitude.

6. An instrument carried in an aircraft for displaying the attitude of the aircraft about its pitch and roll axes, said instrument being of the type having a gyro controlled display in the form of a surface of revolution concentric to and rotatable about a first display axis parallel to said pitch axis and rotatable about a second display axis parallel to said roll axis, and whereon there is a delineation of an equator lying in a plane containing said first display axis that divides the display into upper and lower halves and corresponds to a horizon, said instrument further comprising indicator means relatively fixed with respect to the aircraft and substantially centered on said display delineating a reference that relates the attitude of the aircraft about its said axes to said equator, said instrument being characterized by:

a plurality of pointer indicia on said lower half of the display,

(1) each having a pointing apex which is proximal to said equator and which thus cooperates with said reference to provide an unambiguous and self-explanatory indication of the "up" direction relative to the earth, and

(2) said pointer indicia being spaced apart circumferentially at substantially regular intervals about said first display axis to cooperate with said reference in providing said "up" indication in all diving attitudes of the aircraft.

4,513,510

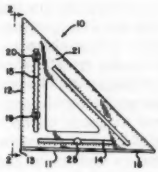
MEASURING TOOL

Ronald C. Swanson, P.O. Box 434, Oak Lawn, Ill. 60453

Filed May 18, 1984, Ser. No. 611,614

Int. Cl.³ B43L *7/00, 13/24*

U.S. Cl. 33—419 **8 Claims**



1. A measuring tool including:

a flat member having the shape of a right triangle and having upper and lower surfaces and a first side and second side which form a right angle at their intersection;

a tee affixed along the edge of said first side which is perpendicular to said flat member and extends from both said upper and lower surfaces of said flat member;

a first slot extending along said first side and running approximately parallel to said first side;
a first stop bolt slidably affixable in said first slot;
a second slot extending along said second side and running approximately parallel to said second side;
a layout bar having a thickness equal to that of the extension of said tee from said surface of said flat member;
said layout bar having a fastening slot perpendicular to said second slot and being alignable with said second slot;
said layout bar having a recessed channel running along its length; and,
a second stop bolt slidably affixable in said recessed channel so that said tee and said layout bar when affixed to said flat member provide a planar surface along said first and second sides, said planar surface being substantially parallel to said surface of said flat member, and said first and second stop bolts extend away from said surface of said flat member and beyond said planar surface formed by said tee and said layout bar.

4,513,511

LAYOUT BOARDS

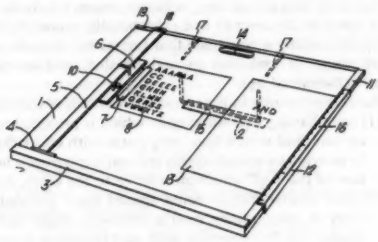
Martin E. Dowzall, Wyckoff, and Vazgen J. Houssian, Union City, both of N.J., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,581

Claims priority, application United Kingdom, Aug. 14, 1981, 8124883

Int. Cl.³ B43L *13/24*

U.S. Cl. 33—447 **7 Claims**



1. A layout board for use with a dry transfer sheet comprising a rectangular board having an upper support surface, a straight track along one edge of the board, a first carriage mounted for sliding movement along said track, an arm on said first carriage extending perpendicular to said track and across said upper support surface, a second carriage mounted slidingly for movement along said arm, means dividing the movement of the second carriage along said arm into a plurality of equally spaced steps, and means mounted on said second carriage for supporting a rectangular dry transfer sheet, said dry transfer sheet extending in a first direction laterally of the arm and having transferable indicia thereon, the support means engaging an edge of the dry transfer sheet parallel with said arm, said first direction being parallel with said track, magnetic clamp means extending parallel to the arm and along one edge of the base board, said magnetic clamp means comprising a fixed strip and an angled bar movable with respect thereto in a direction perpendicular to said track, and said strip and bar being releasably held together by magnetic attraction and adapted to clamp a receptor sheet at one edge, the sheet then extending across the board in a second direction opposite said first direction, and an elongate target area of contrasting color located on said upper support surface, parallel to said track and extending from a position substantially at the center of said upper support surface towards said clamp means,

whereby indicia can be transferred from said dry transfer sheet onto said receptor sheet in said target area.

4,513,512

ANGLE-MEASURING INSTRUMENT HAVING AN INDICATOR FOR THE DEGREE OF ANGLE

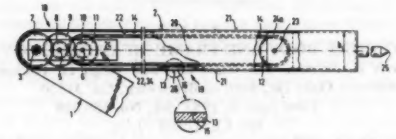
Walter Fischer, Dornstetten-Aach, Fed. Rep. of Germany, assignor to Nestle & Fischer, Dornstetten, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,368

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 8218967[U]

Int. Cl.³ G01B *3/56*

U.S. Cl. 33—471 **9 Claims**



1. An angle-measuring instrument, comprising;
a first arm;
a first shaft rigidly connected to said first arm;
a second, at least partially hollow, arm which is connected to said first arm via said first shaft in such a way as to be pivotable relative thereto;
an indicator having a drive wheel, said indicator being disposed in said second arm and serving, by means of an indicating region, to indicate the angle of spread of said first and second arms relative to one another;
a viewing window arranged in said second arm in said indicating region of said indicator;
a transmission gearing, which is operative to move said indicator and is disposed in said second arm, and is provided with a drive gear which is driven by said first shaft as a function of the angular position of said first and second arms relative to one another;
a slip-free belt drive which is associated with said indicator and said transmission gearing, said belt drive including said drive wheel of said indicator, and an endless belt, the outer side of which, which faces the longitudinal sides of said second arm, being provided with a scale calibrated in degrees of angle of said angle of spread, and being guided along said viewing window, said viewing window being provided with a transparent pane, the inner side of which is provided with a line; and
at any given time, a portion of the outer side of said endless belt being in the vicinity of said viewing window, with the inner surface of said pane thereof being in the immediate vicinity of said last-mentioned portion of said endless belt.

4,513,513

MICROWAVE DRYING OF AMMONIUM PERCHLORATE GRINDING SPHERES

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 10, 1983, Ser. No. 550,435

Int. Cl.³ F26B *3/34*

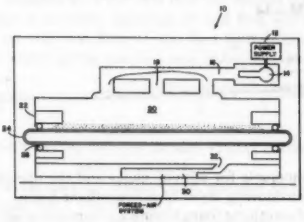
U.S. Cl. 34—1 **2 Claims**

1. A method of removing occluded moisture from the surfaces of ammonium perchlorate grinding spheres selected from silicon carbide and aluminum carbide, said method effecting the removal of occluded moisture to prevent its absorption by ammonium perchlorate during a grinding procedure, said method comprising:

(i) providing a tunnel oven having in combination therewith a microwave generator with an appropriate power supply, said tunnel oven arranged to receive microwave energy through transmission ducts in communication with a channeling device to distribute said microwave energy over said grinding spheres to be dried, said tunnel oven

provided with a heated air supply from a forced-air system to facilitate moisture removal during drying, and said tunnel oven provided with microwave traps and operating controls and safety interlocks to permit grinding spheres to be safely conveyed in and out of said tunnel oven by conveyor means having an adjustable-speed and a continuous meshed dielectric surface having compatibility with a microwave energy environment;

(ii) metering grinding spheres onto said conveyor means to provide a residence time and throughput quantity in and



through said tunnel oven to achieve moisture removal in accordance with a predetermined drying time;

(iii) exposing said grinding spheres to microwave energy having a predetermined frequency range from about 915 megahertz to about 2450 megahertz for a predetermined drying time of up to about 30 minutes to subject adhered or occluded moisture on said grinding spheres to molecular vibration to cause vaporization of said moisture; and

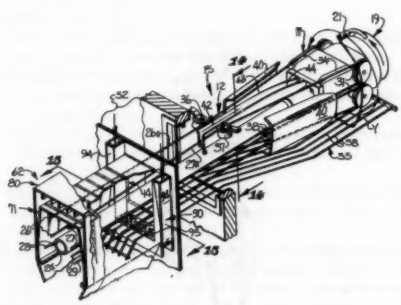
(iv) continuously removing said vaporized moisture by a stream of heated air which is fed through said tunnel oven at a predetermined pressure.

4,513,514

APPARATUS AND METHOD FOR THE HEAT TREATMENT OF YARN

Erwin Steiner, Clover, S.C., assignor to Technology Consulting Corporation, Charlotte, N.C.

Filed Apr. 21, 1983, Ser. No. 487,072
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—24 **21 Claims**



1. An energy efficient apparatus for heat treating a running yarn, and comprising

a yarn treatment chamber, including an entrance opening in one end wall, an exit opening in the opposite end wall, and means for heating the interior thereof,

yarn conveyor means extending through said chamber and through said entrance and exit openings for advancing a running yarn therealong and while supporting the yarn in downwardly hanging, relaxed helically arranged loops, and

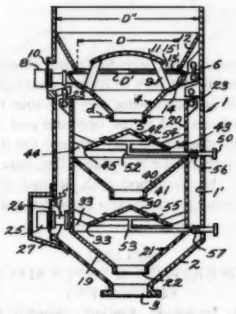
yarn loop support means underlying said conveyor means at least adjacent each of said entrance opening and said exit opening, for supporting and lifting the lower portions of the loops as they move through said openings to thereby reduce the vertical dimension of the loops without reducing the circumferential extent thereof, and so that the vertical dimension of each of said entrance and exit openings is not substantially greater than the vertical dimension of the loops as they move therethrough to thereby minimize the loss of heat through the openings and the entry of outside air into the chamber.

4,513,515

GAS TREATMENT OF PARTICULATE MATERIALS IN STORAGE CONTAINERS

Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Filed Feb. 22, 1983, Ser. No. 468,716
Claims priority, application Sweden, Feb. 25, 1982, 8201165
Int. Cl.³ F26B *3/16*
U.S. Cl. 34—33 **21 Claims**



1. A bin assembly for particulate material, comprising:

a vertical substantially cylindrical container having a vertical interior wall, a feed inlet at the top, and a particulate material discharge at the bottom;

a top interior wall structure of said container, having a bottom opening of diameter D;

a generally conical, generally rigid, first false bottom including an open top portion having a diameter D', wherein D' is greater than D, and having a bottom discharge opening of diameter d, wherein d is much less than D;

means for mounting said first false bottom beneath said top interior wall structure so that said diameters D and D' are substantially concentric, and for mounting said first false bottom for oscillation with respect to said top interior wall structure and said container, and so that said false bottom is a substantial distance above said container discharge opening;

a second generally conical, generally rigid, false bottom;

means for mounting said second false bottom so that it is below said first false bottom, and just above said container discharge outlet, and for mounting said second false bottom for oscillatory movement; and

power means for oscillating said first and second false bottoms.

4,513,516

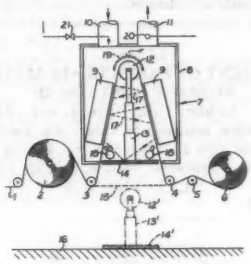
METHOD OF AND APPARATUS FOR THE HEAT-TREATMENT OF A CONTINUOUS WEB

Thomas Björnberg, Viksängen, S-460 60 Vargön, Sweden

Filed Aug. 23, 1983, Ser. No. 525,677
Claims priority, application Sweden, Sep. 8, 1982, 8205095
Int. Cl.³ F26B *3/32*
U.S. Cl. 34—41 **7 Claims**

1. A method of heat treatment of a continuous web, such as

a paper web, comprising the steps of providing a drying unit having at least one movable roller connected to a movable floor , taking the web through said drying unit with the aid of said at least one movable roller connected to said movable floor, constraining the web to follow a U-shaped path within said drying unit, arranging said movable floor to close the space between the two limbs of said U-shaped path within said



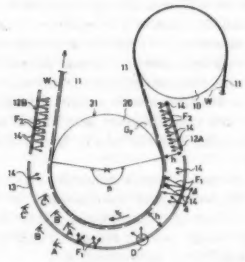
drying unit, exposing the web to drying elements within the drying unit, causing the web to follow a straight path outside said drying unit and disposing the movable roller in a rest position distant from and at the opposite end of said straight path prior to introduction of the web into the drying unit, and then taking the web, by the movable roller, into the drying unit so as to follow the U-shaped path defined by the movable roller, at its extreme position, and deflector rollers.

4,513,517

CYLINDER DRYER FOR PAPER MACHINE OR EQUIVALENT

Timo Vedenpää, Jyväskylä, Finland, assignor to Valmet Oy, Finland

PCT No. PCT/FI81/00030, § 371 Date Dec. 21, 1981, § 102(e) Date Dec. 21, 1981, PCT Pub. No. WO81/03351, PCT Pub. Date Nov. 26, 1981
PCT Filed May 8, 1981, Ser. No. 336,360
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—114 **21 Claims**



1. In a drying section of a paper machine comprising a plurality of drying cylinders, wherein a web with a leading strip thereof is conducted over each cylinder from one cylinder to the next, the leading strip having a substantially narrower width than the web, and comprising a supporting fabric for supporting the conducted web, the improvement comprising means for urging the leading strip of the web against the fabric as it passes about at least one of the cylinders, said means comprising at least one fluid conveying means of width substantially equal to the width of the leading strip, said fluid conveying means comprising a plurality of nozzle holes through which jets of fluid are directed against the leading strip.

4,513,518

SHOE INNER SOLE

Robert A. Jalbert, Swampscott; Anthony P. Galcenski, Jr., Groveland, and Charles C. Urmson, Hingham, all of Mass., assignors to Rogers Foam Corporation, Somerville, Mass.

Filed Sep. 30, 1982, Ser. No. 431,756
Int. Cl.³ A43B *13/40, 13/38*
U.S. Cl. 36—44 **12 Claims**

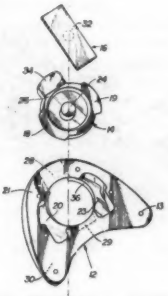
1. An innersole for athletic shoes and the like comprising
a foot-cushioning layer of polyurethane foam,
said polyurethane foam having a compression set of less than 10%,
a layer of polyethylene foam bonded to said polyurethane layer,
said polyethylene layer being thinner than said polyurethane layer,
said polyethylene layer having been thermoformed and thereby given a nonuniform thickness,
said polyurethane foam having a breakdown temperature below the temperature required for thermoforming said polyethylene layer,
said polyurethane foam having a thickness unaltered by thermoforming, and
said polyurethane foam being shaped by said thermoformed polyethylene layer.

4,513,519

ADJUSTABLE SHOE TAP

George Hedrick, 14 Ponderosa Dr., Melville, N.Y. 11747

Filed Jul. 15, 1983, Ser. No. 514,081
Int. Cl.³ A43B *5/12*
U.S. Cl. 36—113 **3 Claims**



1. A dancing tap for attachment to the sole or heel of a dancing shoe, comprising:
(a) a first plate-like body having a first and second face, a central through bore and means for attaching the first body to a shoe;
(b) a second plate-like body having a first and second face and constructed to be received in said central through bore of said first plate-like body and which is adapted to be articulated relative to said first body; and
(c) a sound spring operatively mounted in said first plate-like body so as to be movable by said second plate-like body

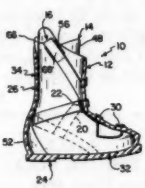
which creates a tapping sound when said second plate-like body articulates about said first body and flexes said sound spring; said first plate-like body contains first and second recesses on said first face and third and fourth recesses on said second face, both originating at said central through bore; said second plate-like body has a first and second protrusion extending from its second face, so as to allow said first and second protrusions of said second plate-like body to be received by said third and fourth recesses on said second face of said first plate-like body; said sound spring is disposed between said first and second plate-like bodies and is movably mounted at said first and second recesses on said first face of said first plate-like body so that said sound spring can flex and be easily removed or replaced.

4,513,520

SKI BOOT WITH INNER BOOT TIGHTENING MECHANISM

Albin G. Koch, Davos-Dorf, Switzerland, assignor to Heierling of Switzerland, Ltd., Warwick, R.I.

Filed Feb. 25, 1983, Ser. No. 469,896
Int. Cl.³ A43B 5/04
U.S. Cl. 36—119 **10 Claims**



1. In a ski boot having a substantially rigid outer shell, a flexible inner boot including an outer surface, an arch portion, a rear portion, an ankle portion and an instep portion and received in the outer shell, and closure means for closing the outer shell, the improvement comprising:

means, coupled to the inner boot and engaging the outer surface thereof, for tightening the inner boot relative to the foot of the skier,

said means including

means for forcing the arch portion of the inner boot generally upwardly towards the arch of the skier's foot,

means for forcing the outer side of the ankle portion of the inner boot generally inwardly towards the outer side of the skier's ankle,

means for forcing the rear portion of the inner boot generally forwardly towards the Achilles tendon of the skier's foot, and

means for forcing the instep portion of the inner boot generally downwardly towards the instep of the skier's foot,

said means further including a single tightening strap, said tightening strap having a first end rigidly coupled to the outer surface of the bottom of the inner boot at the arch portion and a free second end located rearward of the instep portion and above the ankle portion of the inner boot,

said tightening strap engaging the outer surface of the inner boot between said first and second ends;

means for releasably fastening said free second end to the inner boot rearward of the instep portion and above the ankle portion of the inner boot; and

a ring coupled to one of the inner boot outer surface and said tightening strap, and located adjacent the instep portion and on the outer surface of the inner boot,

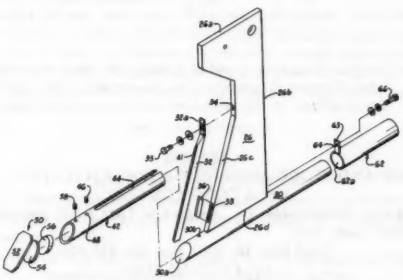
said tightening strap extending rearwardly from its coupling at the arch portion, around the rear portion, around the ankle portion, through said ring, and then rearwardly for the releasably fastening of said second end.

4,513,521

TILLAGE TOOL FOR FORMING AN UNDERGROUND WATER RETENTION TUNNEL

W. F. McDaniel, Rte. 1, Box 58-A, Marland, Okla. 74644

Filed Jun. 21, 1984, Ser. No. 623,018
Int. Cl.³ E02F 5/18
U.S. Cl. 37—193 **1 Claim**



1. A tillage tool for forming an underground tunnel communicating with the surface by a narrow slot comprising:

a vertically extending shank plate having an upper end portion adapted for attachment to a horizontally extending frame, and having a lower edge, a forward edge and a rear edge;

an elongated, horizontally extending cylindrical mounting bar secured to the lower edge of the shank plate and having a beveled forward face;

a forward cylindrical sleeve demountably telescoped over the forward end portion of said mounting bar and having a horizontally extending slot formed therein which receives said shank plate, said forward sleeve being cut transversely on a bevel at its forward end matching that of said beveled forward face;

a plow cap assembly secured to the beveled forward end of said forward sleeve and including a wear plate extending across the forward end of said forward sleeve at the angle of said beveled forward face;

a tubular rear sleeve of the same outside diameter as said forward sleeve telescoped over the rear end portion of said horizontally extending mounting bar and abutting at its forward end, the rear end of said forward sleeve;

a slicer bar detachably secured to the forward edge of said vertically extending shank plate; and

a strip of hard facing material secured to the leading edge of said slicer bar.

4,513,522

LABEL WITH PARTICULAR APPLICATION TO LABORATORY SPECIMEN CONTAINER IDENTIFICATION

William M. Selenke, 18 Gambier Cir., Cincinnati, Ohio 45218

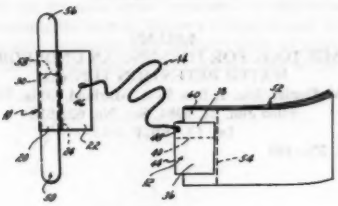
Filed Sep. 16, 1982, Ser. No. 418,668
Int. Cl.³ A44C 3/00
U.S. Cl. 40—2 R **17 Claims**

1. An improved unitary label for attaching a multi-leaf pad to a container comprising:

first and second label elements,

the first label element having a front and a back, the back having an adhesive portion for affixing the first label element to the container, the second label element includ-

ing means for affixing the second label element to the multi-leaf pad, and



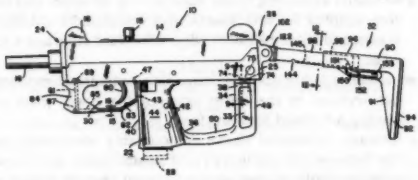
a flexible elongated member joining the first and second label elements in spaced apart relation when said elements are so affixed to the container and the multi-leaf pad.

4,513,523

GRIP AND STOCK ASSEMBLY FOR FACILITATING USE OF A COMPACT GUN

Uzi Gal, Philadelphia, Pa., assignor to Uzia R&D Associates, New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,828
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—72 **21 Claims**



1. An apparatus for use with a gun having an elongated receiver including a forward end, a rearward end and an undersurface, said apparatus comprising:

a pistol grip emanating outwardly from said undersurface a predetermined distance away from the rearward end of said receiver;

stabilizing means including a generally L-shaped bracket having two legs, the distal ends of said legs being secured respectively to the distal end of said pistol grip and the distal end of the receiver behind said pistol grip, said stabilizing means including a forearm receiving portion for stabilizing said gun by pressing up against the forearm of the hand holding said pistol grip; and

stock means pivotally mounted to a portion of said receiver behind said pistol grip, said stock means operative between two extreme positions, a first position where said stock means is in close proximity to said pistol grip and a second position suitable for shoulder firing, said stock means in said first position being adapted to stabilize said gun while firing by pressing up against the forearm of the hand of the user holding said pistol grip.

4,513,524

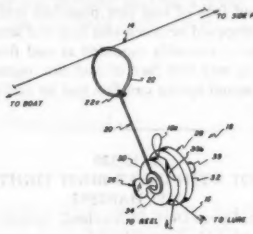
FISHING LINE RELEASE MECHANISM

William L. Jolliff, 640 Holt Rd., Webster, N.Y. 14580

Filed May 23, 1983, Ser. No. 497,090
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—43.12 **9 Claims**

1. A mechanism for releasably connecting a fishing line to an extension member, said mechanism comprising:

an elongated, substantially rigid, wire formed body including an open loop in one end thereof, said open loop having a substantially resilient portion adapted to releasably engage an intermediate portion of said body, so that said open loop can be threaded over said extension member and then said resilient portion can be engaged with said intermediate body portion whereby said body is selectively couplable to said extension member and, once coupled to said extension member is movable with respect such extension member to a desired location there along; and



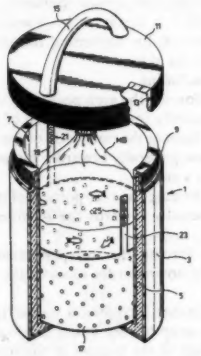
means, associated with said body, for receiving a fishing line, said means including a pair of juxtaposed elements, and hand engagable means for adjustably urging said elements manually into intimate contact, whereby (i) a fishing line can be received therebetween, and (ii) such line can be released therefrom by exertion of a preselected tension on such line.

4,513,525

FISHING BUCKET

Mai Ward, and Carmen Ward, both of 104 Imperial St. South, Massey, Ontario P0P 1P0, Canada

Filed May 11, 1983, Ser. No. 493,633
Int. Cl.³ A01K *97/04*
U.S. Cl. 43—55 **6 Claims**



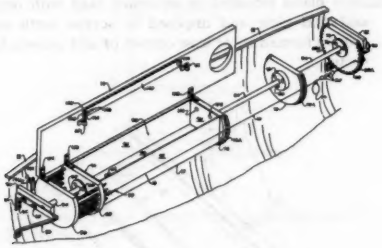
1. A container assembly for receiving fishing minnows and the like, said assembly comprising an outer bucket, a removable lid for sealing said bucket, handle means for carrying said bucket, and a strainer basket for fitting inside said bucket, said strainer basket having a pair of handle portions adapted to detachably engage one another, said handle portions when engaged providing a handle for lifting of said basket from said bucket and when detached from one another being moveable to an out of the way position for gaining access into said basket and being formed of plastic having a memory for springing to an upstanding position to either side of said basket when detached from one another and being resiliently bendable to engage with one another folded across said basket.

4,513,526

FISHING TACKLE ORGANIZER

Virgil Grace, 2900 E. Fourteenth St., Sioux Falls, S. Dak. 57103, and Jerry E. Grace, 7900 N. Harrington, Sioux Falls, S. Dak. 57101

Filed Jun. 7, 1983, Ser. No. 502,007
Int. Cl.[3] A01K *97/00*
U.S. Cl. 43—57.2 20 Claims



1. An apparatus for mounting in a boat to store and display elongated fishing devices such as spinners and snells when the fishing devices are not in use, wherein the fishing devices have first and second ends and a flexible line extending between the first and second ends, the apparatus comprising:

a first bracket for mounting to the boat;

a second bracket for mounting to the boat in spaced relation to the first bracket;

shaft means rotatably supported by the first and second brackets and defining an axis of rotation;

a first plate mounted on the shaft means and having a plurality of circumferentially spaced apertures adjacent its periphery for connection to the first ends of the fishing devices;

a second plate mounted on the shaft means in spaced relationship to the first plate;

resilient connecting means for connecting the second ends of the fishing devices to the second plate while applying resilient bias force which maintains the fishing devices in a taut elongated condition; and

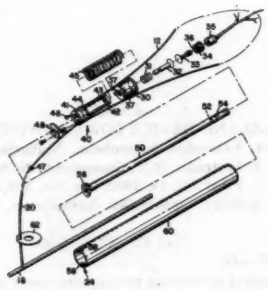
a compartment coaxially aligned with and supported between the first and second plates.

4,513,527

ANIMAL TRAP

Dale L. Wicklund, Rte. 2, Box 157A, Deer River, Minn. 56636

Filed Oct. 22, 1982, Ser. No. 436,010
Int. Cl.[3] A01M *23/34*
U.S. Cl. 43—87 5 Claims



1. An animal trap comprising:

an animal entrapping assembly, said animal entrapping assembly including a shaft, cable block assembly, shoulder block and cable, said block being slidably mounted on said shaft, said cable having a first end attached to said cable block, said cable thereafter externally parallelling said shaft an passing within a first longitudinal groove on said shoulder block, said cable having a second end passing within a second longitudinal groove diametrically opposite to said first longitudinal groove on said shoulder block such that a loop is formed by said cable, said shoulder block being threadably mounted on said shaft;

spring means connected for biasing said entrapping assembly toward a closed position;

ball detent means for releasably holding the entrapping assembly in a set position; and

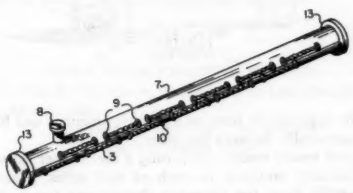
trigger means interactive with said ball detent means and operative when disturbed in either direction along any axis to cause said ball detent means to release said entrapping assembly from the set position allowing said spring means to move the entrapping assembly to a closed position.

4,513,528

ROPE WICK APPLICATOR

Jim E. Dale, Greenville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 969,036, Dec. 13, 1978, abandoned. This application Sep. 18, 1979, Ser. No. 76,706
Int. Cl.[3] A01N *5/00*
U.S. Cl. 47—1.5 58 Claims



1. A rope wick applicator to dispense liquid agricultural chemical solutions upon physical contact with foliage and plants comprising in combination:

(a) a rotatable horizontal reservoir-boom containing a liquid agricultural chemical solution to treat foliage and plants;

(b) a plurality of holes spaced along the outer circumference of the reservoir-boom;

(c) a plurality of wick segments one end of which is fed into a hole in the reservoir-boom and the other end of which is fed into the next hole in the horizontal reservoir-boom thus thoroughly immersing the wick ends in the liquid agricultural chemical solution inside the reservoir-boom;

(d) a plurality of rubber grommets to hold the segments of wick in the holes as well as to prevent spillage or seeping of chemical solution from the reservoir-boom.

4,513,529

METHOD AND MEANS FOR PREVENTING FROST DAMAGE TO CROPS

Douglas R. Reich, 209 Gazelle, North, Fort Myers, Fla. 33903

Filed Aug. 1, 1983, Ser. No. 519,242
Int. Cl.[3] A01G *13/00*
U.S. Cl. 47—2 2 Claims

1. Apparatus for preventing frost damage to growing crops, of the type comprising a shell movable over the ground in a forward direction, blower means in said shell for drawing air thereinto through an air inlet therein and expelling it therefrom through outlet means therein, and fuel burning heater means in said shell for heating the expelled air, said apparatus being characterized by:

A. said shell comprising front, rear and side walls defining a plenum chamber which is substantially symmetrical to a

vertical plane extending through said front and rear walls and which has an open top that provides said air inlet;

B. said shell further comprising three tubes projecting substantially rearwardly from said rear wall of the plenum chamber,

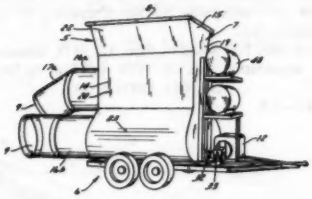
(1) each substantially unrestrictedly opening at its front end into the interior of said plenum chamber and

(2) each having its rear end portion formed to provide an air discharge outlet which cooperates with the air discharge outlets of the other tubes to comprise said outlet means,

(3) two of said tubes being at the bottom of said plenum chamber, spaced to opposite sides of said plane and having their rear end portions arranged to discharge air near ground level in obliquely rearwardly and laterally divergently directed streams that flow along the ground, and

(4) the third of said tubes being upwardly adjacent to said two tubes and having its rear end portion arranged to discharge air in an obliquely downwardly and rearwardly directed stream that flows along the ground;

C. said blower means comprising an air propeller coaxially rotatable in each of said tubes, near the front end thereof,



for drawing air from said plenum chamber and forcing it rearwardly through the tube;

D. said heater means comprising a fuel burner substantially coaxially mounted in each of said tubes, spaced rearwardly from the propeller therein and forwardly from said rear end portion thereof;

E. deflecting means in each tube, adjacent to the fuel burner therein, arranged to impart radially outward deflection to air flowing through the tube and to hot combustion gases issuing from the burner means, so that the stream issuing from the tube is substantially uniformly at a temperature substantially above freezing but low enough to be harmless to persons and plant life;

F. a propeller shaft for each propeller by which the propeller can be rotatably driven, each said shaft having a rear end portion on which its propeller is mounted and having a front end portion in said plenum chamber;

G. a drive shaft in the bottom portion of said plenum chamber having a front end portion that projects through the front wall of the plenum chamber for coupling to power drive means; and

H. transmission means in the plenum chamber drivingly connecting said drive shaft with each of said propeller shafts.

4,513,530

MACHINE FOR LAYING FILM MATERIAL

Duane A. Nyboer, Hamilton, Mich., assignor to Mechanical Transplanter Company, Holland, Mich.

Filed Jun. 22, 1983, Ser. No. 507,291

Int. Cl.³ A01G 7/00

U.S. Cl. 47—9 **1 Claim**

1. A machine for laying film material on the ground for agricultural purposes, comprising:

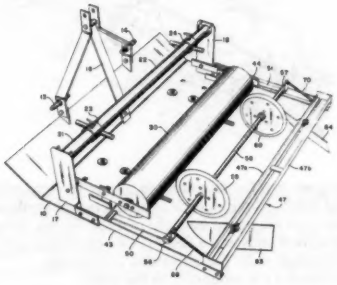
a skid plate having coupling means adapted to associate said machine with a vehicle;

a pair of laterally-spaced film roll brackets mounted on said skid plate; roll-support means engageable with said brackets;

a pair of laterally-spaced arms pivotally mounted on said roll brackets, respectively, and a pressure roller rotatably mounted at the opposite ends thereof on said arms, respectively;

laterally-spaced groove-forming means mounted on the underside of said skid plate;

scraper plates mounted on structure fixed with respect to said skid plate and disposed to scrape earth into the groove formed by at least certain of said groove-forming means;



a frame secured to said skid plate and having laterally spaced cantilever sides; a pair of trailing links pivotally attached to said frame sides, respectively;

an axle secured at its opposite ends, respectively, to said links;

wheels constituting film-depressing members rotatably mounted on said axle in rearward alignment with said groove-forming means, respectively;

a cross-member of said frame secured to said frame side members at the opposite ends thereof from said skid plate, said scraper plates being mounted on said cross-member; and

biasing means extending from said trailing links to said cross-member urging said wheels downward.

4,513,531

METHOD AND DEVICE FOR GROWING PRODUCTS

Jacobus W. Lestraden, Sassenheim, Netherlands, assignor to Schulte & Lestraden B.V., Sassenheim, Netherlands

Filed Jul. 14, 1982, Ser. No. 398,438

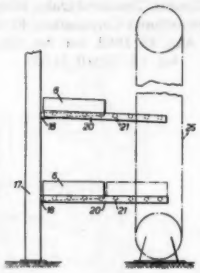
Claims priority, application Netherlands, Jul. 14, 1981, 8103335

Int. Cl.³ A47G 7/00

U.S. Cl. 47—39 **12 Claims**

1. A method of moving propagating cases into and out of a stander in which a plurality of propagating cases are supported one above the other by supporting members forming part of the stander, said supporting members being formed by vertically spaced beams having recesses, comprising the steps of:

inserting rollers through said recesses from below to raise said cases with respect to said beams; and



displacing said raised propagating cases with respect to the supporting members.

4,513,532

GENETIC FACTOR CAPABLE OF ALTERING LEAF NUMBER AND DISTRIBUTION IN MAIZE

Robert C. Muirhead, Jr., Plato Center, Ill., and Donald L. Shaver, Salinas, Calif., assignors to Cornnuts Hybrids, Inc., Oakland, Calif.

Filed Apr. 14, 1983, Ser. No. 484,791
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **27 Claims**

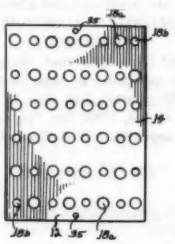
1. A method for producing hybrid seed corn, said method comprising crossing first and second maize plants, where at least one of said maize plants is characterized by a genetic factor which confers an extra leaf phenotype, said genetic factor being capable of transmission to said hybrid seed corn substantially as a single dominant gene.

4,513,533

METHOD AND APPARATUS FOR HYDROPONIC FARMING

Frank Gething, and Edward P. Glenn, both of Tuscon, Ariz., assignors to Kraft, Inc., Glenview, Ill.

Filed Nov. 30, 1982, Ser. No. 445,590
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—63 **13 Claims**



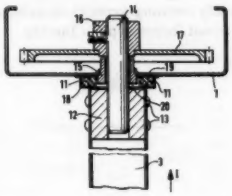
4. A system according to claim 1 wherein said grid means is a single grid and the holders of said grid on said upper face align with approximately one half of said openings.

4,513,534

SHUTTER FOR VENTILATION SYSTEMS

Emil Siegwart, Michael-Blatter-Strasse 6, D-6603 Sulzbach-Neuweiler, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,726
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 7920975[U]
Int. Cl.³ E06B *7/08*
U.S. Cl. 49—91 **19 Claims**



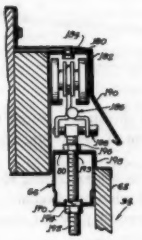
1. A flow control unit for ventilation systems, particularly a louver-type unit, comprising a support; a flow regulating member mounted on said support for movement between an open and a closed position and spaced from said support so as to define a gap therewith; and a resilient sealing member in said gap in sliding contact with said support, said flow regulating member being impressed into said sealing member and engaging the latter so that said sealing member moves with said flow regulating member during displacement of said flow regulating member between said open and closed positions.

4,513,535

BARN DOOR FRAMING SYSTEM

Billie J. Uphoff, Mackinaw, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Dec. 27, 1982, Ser. No. 453,693
Int. Cl.³ E05D *13/02*
U.S. Cl. 49—409 **2 Claims**



1. A door frame system for a sliding door construction for a barn or similar structure, comprising in combination: a frame including a plurality of frame members including vertically spaced top and bottom horizontal frame members and a pair of horizontally spaced vertical side frame members coupled with said top and bottom frame members to define a generally rectilinear door frame, wherein at least said top horizontal frame member comprises elongate, substantially U-shaped channel members; and a hanger assembly for hanging said door frame, said hanger assembly comprising: a truck assembly engageable in a guide track of a U-shaped construction, an elongate, externally threaded fastener member pivotally carried by said truck assembly for extending through an aperture in said top horizontal frame member of said door frame, a bracket member engaged against the open sidewall of said U-shaped top horizontal frame member, said bracket member including at least one upwardly projecting flange dimensioned to interfit closely within said open sidewall to oppose inward

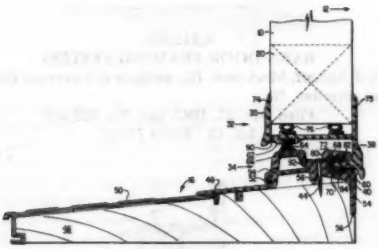
collapse of the adjacent sidewalls, and an aperture formed in said bracket member through which said elongate threaded fastener member extends and a pair of complimentary internally threaded fastener members threadably engaged with said elongate fastener member one engaged above said top horizontal frame member, the other engaged below against said bracket member for grippingly engaging said frame member therebetween and threadably movable to define the height of said door when hung from said elongate fastener member while substantially resisting vertical movement of the door in response to external forces applied thereto.

4,513,536

WEATHER TIGHT SEAL FOR THE SILL OF A HOUSEHOLD DOOR

Jean-Paul Giguère, St-Agapit, Canada, assignor to Donat Flamanc Inc., St.-Apollinaire, Canada

Filed Mar. 31, 1983, Ser. No. 480,677
Claims priority, application Canada, Nov. 12, 1982, 415437
Int. Cl.³ E06B *1/70*
U.S. Cl. 49—470 **5 Claims**



1. An improved threshold system for thermally insulating the lower end region of a domestic door comprising in combination:

a weather strip carrier extending along the lower edge of a door panel and relatively floatably connected thereto with a suitable degree of play for constant adjustment in the vertical direction,

a generally horizontal weather strip wiping surface on the sill of the door directly below said weather strip carrier,

a suitable weather strip extending along said weather strip carrier,

securing means on said weather strip carrier to hold said weather strip to said weather strip carrier in a straight line directly above said weather strip wiping surface, and

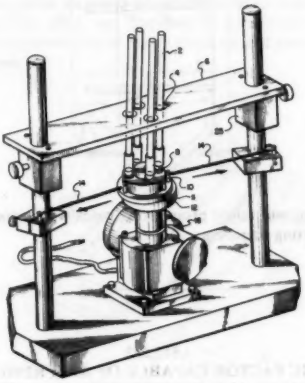
control means for automatically adjusting the floating height of said weather strip carrier above said weather strip wiping surface whenever said door panel assumes the closed position, said control means consisting of a substantial and close fitting tongue-and-groove engagement of said weather strip carrier with the sill of the door which engagement takes place upon closing of said door panel, whereby the floating distance between said weather strip wiping surface and said securing means and their parallelism are maintained independently of said weather strip and solely by virtue of said tongue-and-groove engagement.

4,513,537

DEVICE FOR PREPARING THIN SPECIMENS

Robert A. Spurling, Thousand Oaks; Burton I. Davis, Camarillo, and Norman G. Taylor, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 26, 1983, Ser. No. 526,734
Int. Cl.³ B24B *11/00*
U.S. Cl. 51—71 **3 Claims**



1. A device for dishing specimens comprising:

a rotatable base;

a tool holder eccentrically positioned on said rotatable base by a pivot;

a tool mounted on said tool holder, said tool having a spherical surface;

a pivot plate having a hole extending therethrough, said plate being positioned above and spaced from said rotatable base;

a support for holding said pivot plate, and a spring coupled to said support and to said eccentric pivot to hold said tool in the same radial orientation as said base rotates;

a specimen holder positionable on said tool, said specimen holder comprising:

a rod extendable through said hole in said pivot plate;

means for mounting a specimen on an end of said rod;

a ferrule extending out from said end of said rod, said ferrule being positionable on said spherical surface with the specimen bearing on said spherical surface between said end of said rod and said spherical surface;

whereby rotation of said base causes said tool to grind against said specimen and form a dish in the surface of said specimen.

4,513,538

METHOD OF AND APPARATUS FOR THE SUPERFINISHING OF A THIN-WALL METAL WORKPIECE

Martin Wolters, and Gerd R. Meuer, both of Wuppertal, Fed. Rep. of Germany, assignors to Maschinenfabrik Ernst Thielenhaus GmbH, Wuppertal, Fed. Rep. of Germany

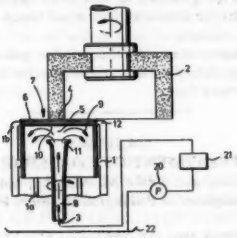
Filed Apr. 8, 1983, Ser. No. 483,249
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306246
Int. Cl.³ B24B *5/00*
U.S. Cl. 51—131.3 **7 Claims**

1. A method of superfinishing a thin-wall workpiece which comprises the steps of:

juxtaposing a surface of said workpiece to be super-finished with a superfinishing tool with said surface being pressed against said tool in a zone of said surface;

rotating said tool about an axis thereof to super-finish said surface of said workpiece;

directing a stream of a coolant fluid against the counter surface of said workpiece in said zone directly opposite said surface of said workpiece, said coolant being directed against said counter surface of said workpiece generally perpendicularly thereto and the coolant fluid being de-



flected radially along said counter surface of said workpiece; and

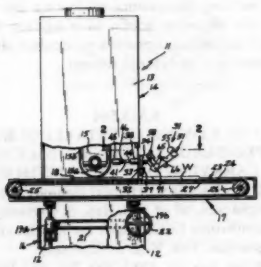
retaining said workpiece in a holder, rotating said holder about an axis of symmetry of said workpiece, and feeding said fluid along the axis of symmetry of said workpiece into contact with said counter surface.

4,513,539

POSITION SETTING DEVICE FOR ABRASIVE BELT GRINDING MACHINE

Clarence I. Steinback, Edina, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed Mar. 15, 1983, Ser. No. 475,534
Int. Cl.³ B24B *21/00, 49/00*
U.S. Cl. 51—138 **17 Claims**



17. A position setting device for use on a workpiece surfacing machine to establish a desired relative position between the workpiece surfacing means of the machine and the workpiece support therefor, the device comprising:

stationary frame means;

first sensor means movably carried by the frame means for engaging and sensing the position of the workpiece surfacing means;

second sensor means movably carried by the frame means for engaging and sensing the position of a workpiece on the workpiece support;

means for relating the position of the first and second sensor means so that the position of one is related to the position of the other;

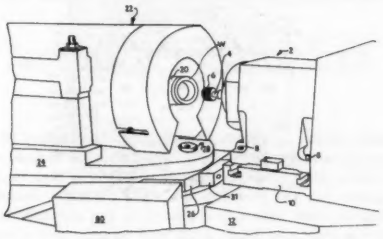
and indicator means having a predetermined reference position for sensing the position of one of said first and second sensor means, and for indicating such position relative to said predetermined reference position.

4,513,540

GRINDING MACHINE WITH CNC PIVOTABLE WORKHEAD

Victor F. Dzewaltowski, and Robert N. Hobbs, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 11, 1983, Ser. No. 512,836
Int. Cl.³ B24B *49/00*
U.S. Cl. 51—165.71 **9 Claims**



1. In a grinding machine having a wheelhead with a grinding wheel rotatable about an axis and a workhead with workpart fixturing means holding a workpart on another axis, said wheelhead and workhead being carried on machine member means, the combination of

(a) a workhead support means on which the workhead is carried, said support means including a pivotable shaft means rotatably mounted on the machine member means by bearing means and on which the support means is pivoted relative to the wheelhead to vary the angular relationship of the workpart axis relative to the grinding wheel axis and including a driven portion remote from the pivotable shaft means,

(b) means drivingly engaging the driven portion of workhead support means remote from the pivotable shaft means for pivoting the workhead support means and its pivotable means,

(c) means for controlling the angular position of the workhead support means and workhead thereon, including rotary shaft position indicating means on and rotatable with the shaft for determining the angular position of the workpart axis by indicating angular movement of the pivotable shaft means of said workhead support means with respect to a reference position and means for actuating the pivoting means to pivot the workhead support means on its pivotable means until the position indicating means indicates that a position is reached corresponding to a desired angular relationship of the workpart axis to the grinding wheel axis, and

(d) fluid lift means between the workhead support means and machine member means remote from the pivotable shaft means adjacent the driven portion to counterbalance mass of the workhead support means and workhead thereon during pivoting.

4,513,541

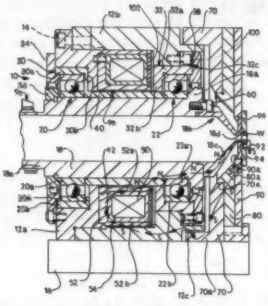
MACHINE WORKHEAD WITH MAGNETIC DRIVER

Lawrence I. Millay, and Victor F. Dzewaltowski, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 23, 1982, Ser. No. 444,131
Int. Cl.³ B24B *5/02*
U.S. Cl. 51—237 R **7 Claims**

1. A machine workhead for rotating a workpart, comprising a stationary housing means, a spindle means rotatably mounted in the housing means for rotation about a longitudinal axis by multiple bearing means spaced apart exteriorily along the length of the spindle means between said spindle means and housing means and having a driving end outside the housing means for engaging a workpart, a magnet means disposed in the housing means radially and longitudinally in the space

between the bearing means in closely spaced radial juxtaposition to the spindle means with the spindle means extending therethrough such that when said magnet means generates magnetic flux said flux is guided by the spindle means and its driving end to traverse between said magnet means and workpart along a flux path from between the bearing means through



the spindle means interiorily of one of said bearing means, means for completing the magnetic flux path between the workpart and magnet means along a flux path through the housing means exteriorily of said one of said bearing means and returning to between the bearing means, and means for rotating the spindle means with the workpart held on the driving end by magnetic flux forces.

4,513,542

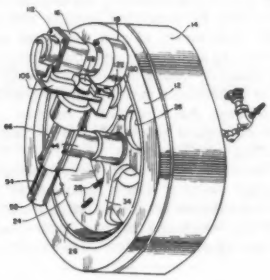
PORTABLE SURFACING MACHINE FOR BOILER MANHOLE

John F. Wilger, Honolulu; Gregory Nakano, Pearl City, and William A. Berman, Honolulu, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 14, 1983, Ser. No. 542,314

Int. Cl.³ B24B *19/08, 19/26*

U.S. Cl. 51—241 S **18 Claims**



1. A portable machine for in-place grinding of a noncircular face of a doorway, with a grinder which has a flat grinding surface, the doorway also having an opposite face and an edge therebetween, said machine comprising:

support means which is adapted to be fixedly mounted in the doorway and span the doorway edge;

a spindle rotatably mounted on the support means with its longitudinal axis substantially coextensive with the longitudinal axis of the doorway;

means mounted to the spindle for reciprocating the grinder in a direction normal to the spindle with the grinding surface maintained in a substantially parallel position with respect to the doorway face;

means for spring biasing the reciprocating means and grinder away from said spindle;

means mounted to the reciprocating means and responsive to the spring biasing means for following the noncircular contour of the doorway face when the spindle is rotated and correspondingly moving the reciprocating means to maintain the grinding surface in an opposed position with respect to the doorway face at all times while the spindle is being rotated,

whereby, upon mounting the grinder and rotating the spindle, the grinding surface of the grinder is engageable with the doorway face.

4,513,543

TREATMENT OF COATED GLASS

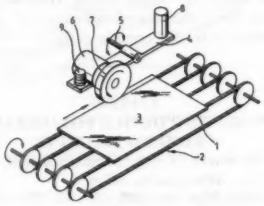
Jack Lawrenson, and Kevin M. Murphy, both of Merseyside, England, assignors to Pilkington Brothers P.L.C., St. Helens, England

Filed Mar. 22, 1983, Ser. No. 477,652

Claims priority, application United Kingdom, Mar. 30, 1982, 8209351

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—283 R **6 Claims**



1. A method of removing a metallic coating layer from a coated glass surface, comprising subjecting the metallic coating layer to the abrasive action of a surface of a stripping material which surface comprises a particulate abrasive carried in a porous matrix of polyvinyl formal.

4,513,544

METHOD OF SAWING CRYSTALLINE RODS, AND MULTIPLE-BLADE INTERNAL-HOLE SAW FOR CARRYING OUT THE METHOD

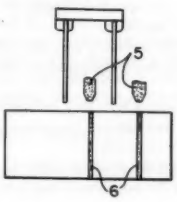
Gunter Lossl, Kirchweidach; Helmut Zauhar, and Horst Stock, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,200

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216200

Int. Cl.³ B24B *1/02*

U.S. Cl. 51—283 R **6 Claims**



1. A method for sawing a crystalline workpiece into wafers, comprising the steps of:

sawing an elongated workpiece of material, by a sequence of

cuts, into a plurality of thin wafers that are connected to one another, including the steps of simultaneously making at least two cuts in the workpiece by at least two blades in a manner to produce a plurality of wafers that are connected to each other, each blade separated from another by a distance greater than the thickness of each said wafer, and successively repeating said step of simultaneously making at least two cuts at different locations along said workpiece, one of said at least two successive cuts being between said previous at least two cuts; and

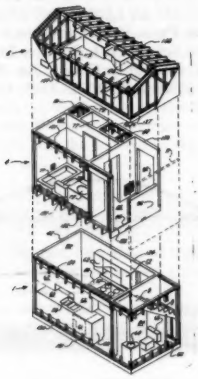
breaking the connection between each of the wafers after the sawing operation.

4,513,545

APPARATUS FOR AND METHOD OF CONSTRUCTING, TRANSPORTING AND ERECTING A STRUCTURE OF TWO OR MORE STORIES COMPRISED OF A PLURALITY OF PREFABRICATED CORE MODULES AND PANELIZED ROOM ELEMENTS

George D. Hopkins, Jr., 1546-48 Magazine St., New Orleans, La. 70130

Filed Sep. 20, 1982, Ser. No. 419,732
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—79.1 **38 Claims**



1. A prefabricated dwelling, having at least two stories comprising:

a. a plurality of prefabricated four-wall non-identical core modules, containing substantilaly all electrical, mechanical and plumbing components necessary to serve said dwelling, said core modules being adapted to be vertically aligned with each other;

b. a base pallet in a lower core module adapted to be received in a preformed monolithic concrete slab, which is provided with a preformed depression to receive said pallet and external utilities connectable with electrical and plumbing lines contained by said core modules;

c. a plurality of pannelized room elements, which interlockingly attach to said core modules to thereby complete said prefabricated dwelling.

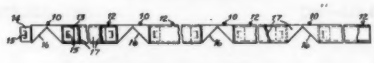
4,513,546

CORNER KEY FOR WINDOW SPACER ELEMENT

Robert J. Gow, Granville, N.Y., assignor to Norton Company, Worcester, Mass.

Filed Mar. 12, 1980, Ser. No. 129,568
Int. Cl.³ E06B *7/12*; E04C *2/38*
U.S. Cl. 52—172 **8 Claims**

1. A corner key means for use with hollow elongated spacer elements and a hot melt sealant to form a frame adapted to be used in the assembly of sheets of glass to form a thermal pane, each key comprising an enlarged body member of fixed length having a bottom and oppositely disposed side walls; a V-shaped notch extending from one side to the other through the body, said notch being positioned about midway of the length of said key with a line connecting the bottom of the V on each side wall lying over the bottom wall of said body member, leg members of a size slightly smaller than said body member integral with said body member, said slightly smaller sized leg members each extending outwardly from the opposite ends of the body and having a crossectional shape to telescopically



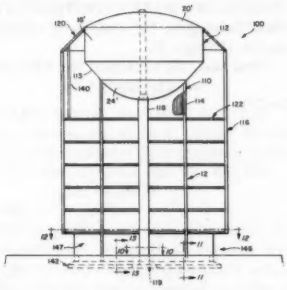
interfit in the ends of the hollow elongated spacer elements, and a layer of hot melt sealant applied to at least two of the side walls of said key and the spacer elements with which it is assembled, whereby when a plurality of said key means and spacer elements are assembled and coated with sealant, the assembly can then be bent on each of said lines across the bottom of said body members to close said V slots to produce a closed frame with a ring of sealant on at least two sides thereof for assembly with sheets of glass to be sealed thereto to form a thermal pane.

4,513,547

MULTI-PURPOSE ELEVATED WATER STORAGE FACILITIES

John O. Cliff, Franklin, and James Edwards, Nashville, both of Tenn., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.

Filed Sep. 10, 1982, Ser. No. 416,681
Int. Cl.³ E04H *7/04, 14/00*
U.S. Cl. 52—194 **9 Claims**



1. An improvement in a multi-story elevated water storage facility comprising: an elevated water storage tank supported on a pillar and occupying substantially all of the top cross-sectional area of the pillar, means fluidly connected to the storage tank for distributing water from the tank to a user located outside the area immediately adjacent to the pillar, the facility having dividing means dividing the pillar into a plurality of levels beneath the tank to define a multi-story building which is located in an elevated water storage tank structure so that a single structure serves as both an elevated water storage facility and a multi-story building, said pillar forming a load bearing core for the water storage tank, a wall exterior to and surrounding the pillar and extending over substantially the full height of the facility, second dividing means dividing the volume defined by said exterior wall into a plurality of levels, the lowermost second dividing means being at a predetermined distance above a foundation level so that an overhang recess portion exists between the outside wall and the foundation

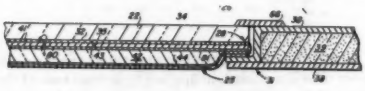
level, and said pillar bearing the load of the water storage tank thereon by thick cone plates affixed at an angle on the top of the pillar.

4,513,548

INSULATED WINDOW COVER APPARATUS

Gregory H. Parker, 6450 N. 78th St., #242, Scottsdale, Ariz. 85253

Filed Apr. 25, 1983, Ser. No. 488,261
Int. Cl.³ E06B *3/26*
U.S. Cl. 52—202 **30 Claims**



1. An insulated window insert apparatus for use in motor vehicles having at least one window in the top thereof, said at least one window including a window pane and a window pane holder, comprising:

a generally rectangular sheet of support material for blocking out light from the sun;

insulation means operably disposed proximate said sheet of support material for absorbing heat from the sun while simultaneously preventing heat from the air conditioned cool air inside the vehicle from escaping through said top window pane; and

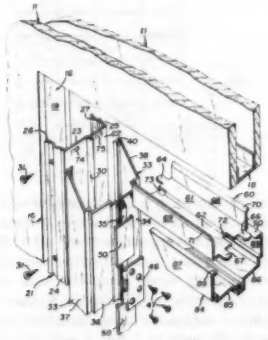
means for covering said generally rectangular sheet of support material and said insulation means, said covering means including a bottom portion having fabric means which substantially matches that of the motor vehicle interior for esthetic purposes and the like.

4,513,549

PRE-MITERED DOORFRAME ASSEMBLY FOR PARTITION WALL CONSTRUCTION

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Mar. 25, 1983, Ser. No. 480,150
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—211 **14 Claims**



1. A doorframe assembly adapted to be mounted in a door opening in a wall and to support a door, comprising in combination:

A. a pair of metal backer jamb members adapted to be mounted in said door opening, one for supporting a hinge jamb and the other for supporting a strike jamb, adapted for attachment to opposite sides of said door opening, said backer jamb members being of generally U-shaped structure and comprising a web portion having a pair of flanges defining a generally U-shaped structure, said flanges being adapted for fastening at opposite wall surfaces adjacent to said door opening,

B. a pair of header clips comprising a web portion having a pair of flanges forming a generally U-shaped structure,

C. means for affixing each header clip at one end to the upper end of one of said backer jamb members,

D. generally U-shaped jamb members adapted to be snap-mounted one on each of said backer jamb members, and

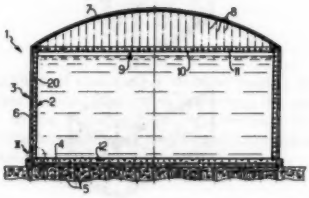
E. a generally U-shaped header member adapted to be snap-mounted on said header clips, the upper ends of said jamb members and both ends of said header members having complementary mitered ends to form a close mitered fit.

4,513,550

METHOD OF BUILDING A RESERVOIR FOR STORING A LIQUID AT LOW TEMPERATURE

Michel Kotcharian, Paris, France, assignor to Technigaz, France

Filed Feb. 8, 1981, Ser. No. 233,593
Claims priority, application France, Jun. 8, 1979, 79 14716
Int. Cl.³ E04B *1/32;* F17C *3/02, 3/04, 13/00*
U.S. Cl. 52—249 **14 Claims**



1. A method of building a reservoir for storing a liquid at low temperature such as liquified natural gas, comprising an inner tank having a top and bottom and an outer casing or vessel having inner and outer walls separated from the tank by a space of relatively small width filled with heat-insulating means forming a secondary barrier, characterized in that it comprises previously building the outer vessel and in mounting therein the inner tank, and then in building the heat-insulating means in the aforesaid space by performing successive operations comprising the steps of:

arranging on the inner wall of the outer vessel a continuous lining forming a first fluid-tight barrier;

arranging bands or panels along the vertical walls of the inner tank without permanently securing said bands or panels, said bands or panels being made of material for forming a second fluidtight barrier, and jointing said bands or panels in a fluid tight manner formed of sub-blocks of complementary shapes contacting against one another so as to be slightly slidable on one another to compensate for the dimensional tolerances of said space between the inner tank and the outer vessel, associated with a second continuous, thin lining of cryogenic material forming a second fluid-tight barrier, the said structure being supported by the outer vessel and arranged simply around the inner tank, the building of the structure by stacking the blocks being performed either in horizontal slices or in vertical bands.

4,513,551

STRUCTURAL SUPPORT

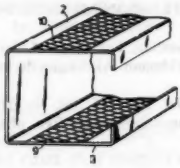
Ulf Gauffin, Dagermansgatan 6, S-754 28 Uppsala, and Mikael Hellsten, Lärkvägen 29, S-185 00 Vaxholm, both of Sweden

Filed Mar. 31, 1983, Ser. No. 480,729

Claims priority, application Sweden, May 12, 1982, 8202993; Feb. 16, 1983, 8300873

Int. Cl.³ E04C 3/16

U.S. Cl. 52—364 **2 Claims**



1. A structural support made of sheet metal, for example, for supporting a building panel or other structural member which is to be fastened to a surface on the support by means of screws, nails and like fasteners, said surface having an expanded metal portion, the expanded metal portion having elongated apertures each defined by narrow yieldable bands of metal, each narrow yieldable band of metal having surface portions inclined to the direction in which the fastener is driven to form fastener slide paths which will guide the point of the fastener into an aperture, the smallest dimension of each aperture being less than the diameter of the fastener so the fastener will force apart the metal bands forming an aperture as it is driven into said surface to firmly seat the fastener in the aperture.

4,513,552

SHEET ALUMINUM FIREPROOF CONSTRUCTION ELEMENT

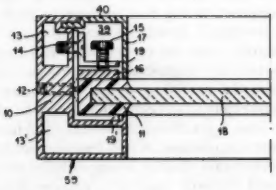
Albert Breithaupt, Cologne, Fed. Rep. of Germany, assignor to Trube & Kings Kommanditgesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 241,381, Mar. 6, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,432

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009729

Int. Cl.³ E04B 1/62

U.S. Cl. 52—400 **17 Claims**



1. A fireproof building element comprising:

a four-sided panel of nonflammable material with two planar surfaces; and

a four-legged framework of nonflammable material surrounding said panel, each side of said panel being engaged by a leg of said framework having a rectangular cross-section divided in the plane of a surface of said panel into two frame portions together defining a recess accommodating an edge of said panel, said leg including at least one aluminum profile forming two opposite faces of said leg remote from said recess and parallel to said panel, at least one of said frame portions forming a chamber offset from said plane and separated from one of said faces by a sheet-aluminum wall having a thickness of at least one millimeter, said leg further having an aluminum core substantially in line with said panel and of greater thickness than the panel.

4,513,553

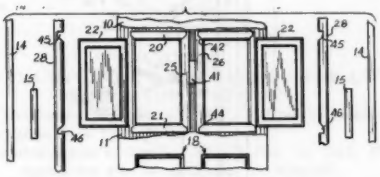
HOLLOW CORE DOOR AND METHOD FOR MAKING

David J. Barry, 1739 W. Nancy Creek Dr., N.E., Atlanta, Ga. 30319

Filed Jul. 11, 1983, Ser. No. 512,460

Int. Cl.³ E06B 3/70

U.S. Cl. 52—456 **8 Claims**



1. A hollow core panel door including a front and rear facing defining cut-outs therein and located for defining a plurality of panels, a panel assembly between said facings for supporting said plurality of panels, said panel assembly including a plurality of top core rails located adjacent to the upper edge of said cut-outs, a plurality of bottom core rails located adjacent to the lower edge of said cut-outs, and a plurality of panel inserts, said top core rails and said bottom core rails defining grooves therein for slidably receiving said panel in sets, said panel assembly further including a first core stile defining a groove therein, said first core stile being located to receive one edge of said plurality of panels, a second core stile parallel to said first core stile and defining a groove receiving another edge of said plurality of panels, said first core stile and said second core stile defining notches therein for receiving the opposite ends fo each of said core rails, said panel door further including outside rails and outside stiles at the edges of said facings.

4,513,554

BARN DOOR FRAMING SYSTEM

Larry Johnson, Sterling, and Billie J. Uphoff, Mackinaw, both of Ill., assignors to Lawrence Brothers, Inc., Sterling, Ill.

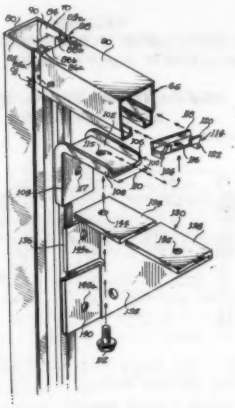
Filed Dec. 27, 1982, Ser. No. 453,156

Int. Cl.³ E04C 2/38

U.S. Cl. 52—657 **9 Claims**

1. A door frame system or a frame-and-panel door construction for a barn, or similar structure, comprising: a plurality of horizontal frame members including vertically spaced top and bottom horizontal frame members, and a plurality of horizontally spaced vertical side frame members joined with said top and bottom frame members to define a generally rectilinear frame structure, all of said frame members comprising elongate, substantially U-shaped channel members which are substantially identical in cross-section, wherein said channel member can be provided by stock material of identical U-shaped cross-section and cut to length as needed, to provide said frame member with each frame member including three continuous sidewalls and an open sidewall, and corner joining means comprising corner brackets for joining respective top and bottom frame members with respective adjacent vertical frame members to define corner joints for said substantially rectilinear frame structure said corner brackets including a pair of transversely disposed sections, each section including a pair of spaced side flanges, said corner brackets being disposed exteriorly of the frame members and at the periphery of a joint between said frame members, with the side flanges of a first one of said transverse sections engaging the opposed outer side walls of one of said frame members, and the side flanges of the

second of said transverse sections engaging the opposed outer side walls of the other of said frame members, and bracing means associated with each said corner joint and disposed



exteriorly of the frame members and cooperating with said corner brackets to further strengthen said joint and assure the substantially rectilinear configuration of said frame.

4,513,555

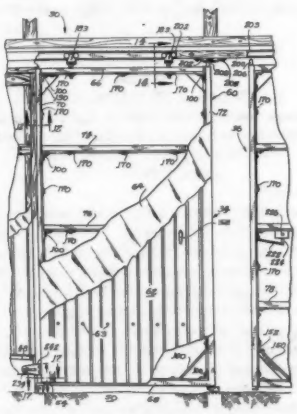
BARN DOOR FRAMING SYSTEM

Larry Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Dec. 27, 1982, Ser. No. 453,692

Int. Cl.³ E04C *2/38*

U.S. Cl. 52—657 **7 Claims**



1. A door frame system for a frame-and-panel door construction for a barn, or similar structure, comprising: a plurality of horizontal frame members including vertically spaced top and bottom horizontal frame members, and a plurality of horizontally spaced vertical side frame members joined with said top and bottom frame members to define a generally rectilinear frame structure, said top, bottom and side frame members comprising elongate, substantially U-shaped channel members of similar cross-section, and corner joining means comprising corner brackets for joining respective top and bottom frame members with respective adjacent vertical side frame members to define corner joints for said substantially rectilinear frame structure, each said corner bracket comprising transversely disposed base sections, each said base section having spaced upstanding side flanges thereto to define a pair of similar U-shaped surface configurations for embracing respective outer side faces of the side walls of the respective U-shaped frame members, and clamping means for coupling said corner backets to the respective frame members.

4,513,556

REMOVABLE TENSION MEMBER FOR A GROUT ANCHOR

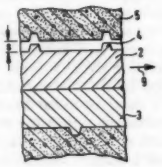
Thomas Herbst, Wessling, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,870

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039080

Int. Cl.³ E04B *1/38;* E02D *5/80*

U.S. Cl. 52—698 **12 Claims**



1. Tension member for a grout anchor such as for temporarily anchoring a structure to the earth, said tension member being insertable into a borehole formed in the earth so that in the inserted position said tension member can be grouted in for affording a temporary anchoring effect and subsequently can be removed from the borehole when the anchoring effect is no longer required, said tension member having an elongated central axis and comprising at least two elongated co-extensive complementary shaped bars extending in the direction of the central axis and capable of transmitting tensile forces and forming, in combination, a regular exterior periphery extending around and spaced radially outwardly from the central axis and defining the outside surface of said shaped bars, each said bar having a first end arranged to be inserted first into the borehole and a second end arranged to receive a pulling force, in the inserted position said bars disposed in spaced relation and having opposed facing first surfaces located inwardly of the exterior periphery directed toward the central axis and spaced outwardly from the central axis, ribs formed on and projecting outwardly beyond the exterior periphery of said bars with said ribs extending across the exterior periphery generally transversely of the elongated direction of said bars so that said ribs have a rectilinear transversely extending dimension, in the inserted position of said tension member forming a temporary anchor said ribs are arranged to be engaged within a settable grout material such as a cement grout, and first means extending in the elongated direction of said bars and having oppositely disposed second surfaces positioned between and being in axially sliding contact with the opposed facing first surfaces of said bars in the inserted position of said tension member for maintaining the facing first surfaces in spaced relation, said first means extending along the central axis, at least one of said first and second surfaces being smooth and flat in the elongated direction of said bars, said first means being slidably removable by rectilinear movement in the direction of the central axis from between said bars and, when removed, providing an open space of the same dimension in the central axis direction between the facing first surfaces and having at least a dimension perpendicular to the central axis direction and extending between the opposed facing first surfaces so that a pulling force exerted on the second end of said

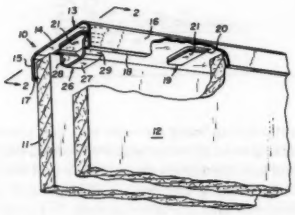
bars one at a time permits said bars to move inwardly toward the central axis freeing said ribs from engagement with the grout material whereby said bars can then be withdrawn from the borehole in the direction of the central axis.

4,513,557

CLIP FOR USE WITH RUNNER AND RUNNER ASSEMBLY INCLUDING THE CLIP

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Feb. 22, 1984, Ser. No. 582,547
Int. Cl.³ E04C *3/08*
U.S. Cl. 52—735 **14 Claims**



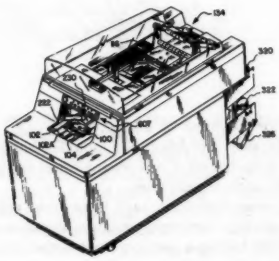
1. A clip adapted to be inserted and retained in a channel-form runner having integrally provided retention means for retaining said clip and cooperating with said runner to retain wall panels, said clip being channel-form and comprising a web, a pair of substantially parallel clip flanges each connected at one edge to an edge of said web, a pair of flat outwardly directed tabs, one extending from the outer edge of each of said clip flanges, and a pair of flat inwardly directed tabs, one tab struck from each of said clip flanges, said outwardly directed tab and said inwardly directed tabs being coplanar and substantially perpendicular to said clip flanges and adapted to engage retention means provided in said runner.

4,513,558

JAM DETECTION AND REMOVAL FOR WRAPPING MACHINE

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,685
Int. Cl.³ B65B *11/54, 11/12*
U.S. Cl. 53—77 **5 Claims**



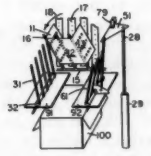
1. In a film wrapping machine including means for positioning a section of film for wrapping a generally rectangular package, a collapsible elevator for raising a package to be wrapped into said section of film, folder means having side underfolders and a rear underfolder for folding the film under three sides of a package while simultaneously collapsing said elevator to transfer support of a package from said elevator to said folder means, and pusher means for completing the wrapping of a package by ejecting the package from the machine, a jam detection and removal improvement comprising a control system including means for monitoring the operation of said wrapping machine to detect a jam condition and for stopping said machine upon detection of a jam condition, said control system further including means for operating said film wrapping machine in a reverse direction in discrete steps within a defined and limited range of the operating cycle of said machine to avoid the elevator collapse portion of said cycle whereby said film wrapping machine is rapidly stopped upon the occurrence of a jam condition and removal of the jam condition is facilitated by incremental reverse operation of said machine.

4,513,559

BAG TRANSPORTER, FOLDER AND LOADER AND METHOD FOR OPERATION

Fox J. Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 329,371, Dec. 10, 1981,. This application Apr. 25, 1983, Ser. No. 488,243
Int. Cl.³ B65B *63/04*
U.S. Cl. 53—429 **34 Claims**



1. A swatter assembly comprising:
a pivotable swatter for moving thin sheet-like articles from a first location to a second location and comprising a rotatable shaft and at least one element projecting from said shaft for contacting and moving said article;
means adjacent said first location for conveying a said article to a position where it is contacted by and moved by said projecting element;
means adjacent said second location for receiving a said article moved by said swatter; and,
means for reciprocally rotating said shaft and comprising;
a driving cylinder including a driving rod;
a swatter arm fixedly connected to said shaft; and
means responsive to a constant velocity movement of said driving rod for moving said swatter arm to forwardly move said swatter toward said receiving means with a movement force which causes said swatter to gradually decelerate to a stop as it approaches said second location.

5. A method for sequentially folding and loading a plurality of thin, limp, sheet-type articles into a receptacle, comprising the following steps:
A. sequentially delivering each article of said plurality of articles to a folding station having a movable platform and a folding member in standby position, said article being gradually decelerated to a stop as it approaches said folding station;
B. folding said article at least once with said folding member, whereby the folded article is transversely spaced from and aligned with the bottom of a receptacle therefor while supported by said platform;
C. removing said platform from said folded article and simultaneously pushing said folded article toward said bottom by propelling said folding member;
D. loading said folded article within said receptacle;
E. returning said folding member to said folding station and to said standby position; and
F. returning said platform to said folding station.

24. An apparatus for sequentially delivering, folding and

loading a plurality of thin, limp, sheet-type articles into a receptacle having a bottom, after said articles have been sequentially conveyed to a pick-up station, and for packing said loaded articles within said receptacle, comprising:

A. a delivery assembly for sequentially delivering said articles to a folding station, comprising:

1. a pivotable swatter, having at least one member which is perpendicularly disposed to the axis of rotation of said swatter, which is disposed and actuated so that said member is pivotally beyond each said article when said article arrives at said pick-up station, whereby said article is lengthwise divided by said member of said swatter into three parts, and

2. a first actuator means for revolving said swatter through an arc, whereby said article is delivered to said folding station with a middle portion supported by said swatter and with first and second end portions partially folded beyond said member of said swatter, said first actuator means gradually decelerating said swatter to a stop as it approaches the end of its movement toward said folding station;

B. a folding assembly for sequentially folding said articles, comprising:

1. a pair of revolvable trays which are disposed in side-by-side relationship to form a platform which is aligned with, parallel to, but spaced from said bottom and is adapted to receive at least said middle portion,

2. a pair of pivotable flippers which are disposed approximately perpendicularly to said platform when in article-receiving position and are spaced apart by about the length of one said part to form said folding station, in combination with said trays, as a U-shaped channel,

3. a second actuator means for pivoting one said flipper through about 90° to lay said first end portion onto said middle portion and for returning said one flipper to said article-receiving position,

4. a third actuator means for pivoting the other said flipper through about 90° to lay said second end portion onto said first end portion, whereby said article is fully folded, and for returning said other flipper to said article-receiving position after said loading and said packing are completed; and

C. a loading assembly for loading said fully folded articles into said receptacle and for packing said articles against said bottom with a selected force, comprising:

1. a tray-removing means for sidewardly moving said pair of trays beyond said folding station,

2. a propulsion means for transversely moving said other flipper and said fully folded article toward said bottom to effectuate said loading and for returning said other flipper to said folding station after said packing, and

3. a packing means for exerting said selected force upon said fully folded article and against said bottom to accomplish said packing before said returning.

4,513,560

SKIN PACKAGING MACHINE WITH INCLINED OVEN

Alexander Hollingsworth, Anderson, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Jun. 1, 1981, Ser. No. 265,674
Int. Cl.³ B65B *11/52*
U.S. Cl. 53—509 **1 Claim**

1. A skin packaging machine comprising,

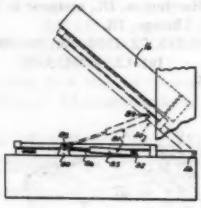
a base having a horizontal foraminous surface for receiving a porous board and an article to be packaged,

an oven mounted above said foraminous surface and having a downwardly-facing planar opening through which heat can be directed, said opening being inclined intermediate a vertical and a horizontal position,

a frame adapted to carry a film between positions adjacent said horizontal surface and said oven opening, respectively,

means for pivoting said frame to said base on a first axis to swing between said two positions,

and a pneumatic spring pivotally connected between said base on a second axis and said frame on a third axis for supporting said frame in an upper position adjacent said oven opening when said frame is swung to said upper position,



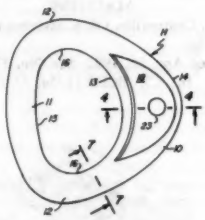
said pneumatic spring being movable to a first position holding said frame in an upper position wherein a line between said second and third pivot axes is above said first axis, and to a position holding said frame adjacent said horizontal surface wherein said line is below said first axis, whereby to direct the force of said pneumatic spring in such a way as to hold said frame in the desired position after the frame has been moved to the desired position.

4,513,561

FLEXIBLE SPUR HOLDERS AND SPURS

Charles L. Welton, Rte. 2, Box 505 V, Golden, Colo. 80401, and Pershing R. Van Scoyk, 7193 W. 32nd Ave., Wheatridge, Colo. 80033

Continuation-in-part of Ser. No. 289,808, Aug. 3, 1981, Pat. No. 4,443,996. This application Sep. 29, 1982, Ser. No. 428,351
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.³ A43C *17/00*
U.S. Cl. 54—83 R **9 Claims**



8. A spur for mounting on a boot, comprising:

a rear body, sides and front loop moulded integrally;

said front loop having a downward offset connecting said loop with each of said sides;

said sides extending from said front loop rearwardly in spaced, slightly converging relation to said rear body;

said rear body having a concave front surface slanted downwardly and forwardly;

said rear body and a major portion of each of said sides having an inwardly extending, downwardly tapered, integral rib adapted to engage a crevice between the heel and a counter heel of said boot, with said front loop engaging the front of said heel and said sides being stretched between said front loop and said rear body; and

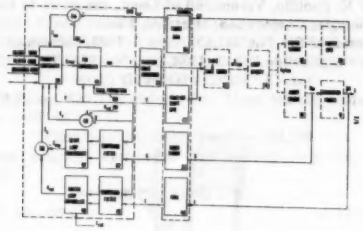
means connected to said rear body for supporting a spur rowel.

4,513,562

COMBINE GROUND SPEED CONTROL SYSTEM

Gilbert J. I. Strubbe, Loppem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Apr. 12, 1984, Ser. No. 599,380
Int. Cl.[3] A01D *41/02*
U.S. Cl. 56—10.2 16 Claims



1. In a combine harvester having an engine, a traction drive transmission, a header, a threshing and separating mechanism, and a machine throughput control system including a machine loading control loop operable to produce a signal representative of the machine loading, an improved throughput control system comprising:

a grain loss control loop operable to produce a signal representative of grain loss;

a grain loss controller operable continuously to establish a causal relationship between machine loading and grain loss, the machine loading signal, the causal relationship current with that machine loading signal, and a reference loss signal being applied to the grain loss controller to derive a reference machine loading signal therefrom; and

means for algebraically summing the machine loading signal and the reference machine loading signal to produce a machine loading error signal which is used to control machine throughput.

4,513,563

LAWN MOWER ROTARY ASSEMBLY

Carl A. Roser, Lake City, Fla., and Arthur J. Ehrler, Mission, Canada, assignors to Carl A. Roser, Kingsport, Tenn.

Filed Feb. 23, 1983, Ser. No. 469,170
Int. Cl.[3] A01D *55/18*
U.S. Cl. 56—295 16 Claims

1. A rotor assembly for a rotary lawn mower comprising a rotor body, filament cutters, and a shear pin coupler; said rotor body being a flat star-shaped disk having a plurality of equally spaced identical arms projecting outwardly from the center of said rotor, each of said arms having an arcuate leading edge and an arcuate trailing edge connecting the center of the rotor body to respective ends of the outer periphery of the rotor body, each of said arms including near its outer periphery a lug for gripping one end of a short length of filament, each said lug being located on said trailing edge adjacent the outer edge of respective said arm, each said lug having a passageway therethrough in the radial direction with respect to said rotor body for passing the short length of filament therethrough with the filament being disposed in generally the same arcuate direction as said arcuate trailing edge during rotation of said rotor assembly; said coupler being a disk fitting into a central counterbore in said rotor body and having two cylindrical members projecting upwardly from the upper surface of said disk and symmetrically positioned diametrically opposite from each other, the said menbers mating with two recesses in said counterbore, said disk having a central hub portion projecting upwardly for accommodating a drive shaft of a rotary lawn mower, said cylindrical members being sheared when said rotor engages an immovable object to minimize damage to said rotor and a motor driving same.

4,513,564

YARN

Magda Seehawer, Sonnhalde 9, 7400 Tübingen 1, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,545
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 8317790[U]
Int. Cl.[3] A41G *9/00*; D02G *3/00*
U.S. Cl. 57—206 10 Claims

1. A yarn, comprising at least two individual threads twisted with one another along their entire length, and a plurality of feathers having quill portions and feather portions and inserted into said twisted threads at predetermined intervals from each other and such that the quill portions of the feathers are fully inserted into the twisted threads and the feather portions thereof project outwardly from the threads to form a fleecy feather yarn.

4,513,565

SEWING THREAD

Takao Negishi, and Teiryo Kojima, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 292,424, Aug. 14, 1981,. This application Feb. 1, 1983, Ser. No. 463,030
Int. Cl.[3] D02G *1/02, 3/28, 3/46*
U.S. Cl. 57—236 14 Claims

1. A sewing thread (Y) comprising at least one false twisted polyester multifilament yarn (X) having an intrinsic viscosity (IV) of between 0.65 and 1.20 determined at a temperature of 25° C. in O-chlorophenol solution having a concentration of 8% by weight, wherein an individual constituent filament of said multifilament yarn (X) has portions partially interlaced with other filaments constituting said multifilament yarn (X) along the length-wise direction thereof and a part of the individual constituent filament of said multifilament yarn (X) is protruded from the surface of said multifilament yarn (X); and the torque of said sewing thread (Y), measured by each of the following two measuring steps, is at most 4 turns/50 cm, in spite of the fact that substantially all filaments constituting said sewing thread (Y) have been subjected to the same false twisting, wherein the torque is determined using the following procedure;

the number of turns of a loop around a vertical axis until said loop becomes stationary is counted in the following two steps (1) and (2):

(1) sewing thread (Y) is formed in a single loop having a circumference of 1 m and said loop is suspended by a thread made of the same material; and

(2) a weight of 1 gram/denier is applied to the lower end of said loop via a thread made of the same material and said weight is then removed from said loop.

4,513,566

RESILIENT SUPPORT FOR A HIGH-SPEED ROTOR

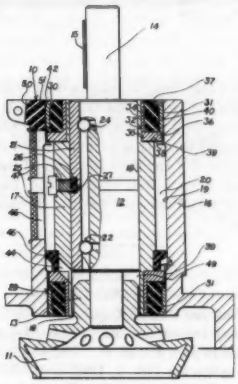
Zdenek Rajsigl, Brno; Milos Mladek; Michal Blasko, both of Usti n/Orl., and Josef Smatana, Bytca, all of Czechoslovakia, assignors to ZVL Vyzkumny ustav pro valiva loziska Brno koncernova ucelova organizace, Brno, Czechoslovakia

Filed May 31, 1983, Ser. No. 499,177

Claims priority, application Czechoslovakia, May 31, 1982, 3984-82

Int. Cl.³ D01H *7/882*

U.S. Cl. 57—406 **3 Claims**



1. A resilient support for a high-speed rotor mounted upon a rotor shaft for the spinning mechanism of an open-end spinning machine, said support including a housing for the spinning mechanism, said housing having a generally circular cylindrical passage therethrough, a central sleeve mounted within the passage in the housing coaxial thereof, the rotor shaft being disposed centrally within the central sleeve and coaxial therewith, a double-row rolling bearing for the rotor shaft, said bearing being disposed between the central sleeve and the rotor shaft, the rows of the rolling bearing being spaced substantially from each other along the length of the rotor shaft, resilient damping elements disposed near the respective ends of the central sleeve and between the central sleeve and the housing, the rotor having a hub with a circular cylindrical portion which is disposed within and end of the passage in the housing with a clearance between it and the wall of the portion of the passage through the housing in which it is disposed, annular seats at the opposite ends of the central sleeve receiving the resilient damping elements, the portion of the bore in the central sleeve disposed at the end thereof adjacent to the rotor having a diameter which is the same as the outer diameter of the double-row rolling bearing, the resilient damping elements each having an annular radially inner part and an annular radially outer part, there being an annular radially resilient intermediate part disposed between and bonded to the inner and outer parts of the resilient elements, the resilient damping means being provided with transverse shoulders which abut the end walls of the respective seats in the central sleeve, the housing having end orifices, said shoulders having their diameters reduced by the height of a limiting gap between them and the diameter of the end orifices of the housing of the spinning mechanism.

4,513,567

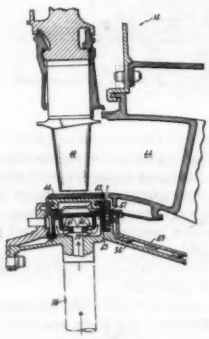
GAS TURBINE ENGINE ACTIVE CLEARANCE CONTROL

Paul J. Deveau, Ellington; Paul B. Greenberg, Manchester, and Roger E. Paolillo, Vernon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 317,633, Nov. 2, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,770

Int. Cl.³ F02G *3/00;* **F01D** *11/08*

U.S. Cl. 60—39.02 **1 Claim**



1. A method of controlling the clearance between opposing seal elements of the rotor assembly and the stator assembly including supporting structure of a dual rotor gas turbine engine having high pressure compressor and high pressure turbine, low compressor and high pressure turbine rotors comprising the steps of:

flowing relatively low pressure, low temperature air from the compressor of the engine to a modulating and mixing valve;

flowing relatively high pressure, high temperature air from the compressor of the engine to said modulating and mixing valve;

mixing said relatively low pressure, low temperature air and said relatively high pressure, high temperature air at the modulating valve in proportions functionally related to engine operating condition to produce a mixture of air having a desired temperature, pressure and flow rate at that operating condition for thermally modifying the diameter of the turbine case adjacent said high pressure turbine;

flowing said mixed air to the high pressure turbine section of the engine and against the case thereof for thermally varying the diameter of said case to achieve control over clearances between the rotor and stator assemblies of said high pressure turbine and admitting the effluent mixed air from said case internally thereof so as to cool said supporting structure;

flowing relatively low pressure, low temperature air from the compressor of the engine to a second modulating and mixing valve;

flowing relatively high pressure, high temperature air from the compressor of the engine to said second modulating and mixing valve;

mixing said relatively low pressure, low temperature air and said relatively high pressure, high temperature air at the second modulating valve in proportions functionally related to engine operating condition to produce a mixture of air having a desired temperature, pressure and flow rate at that operating condition for thermally modifying the diameter of the turbine case; and

flowing said air mixed at the second modulating valve to the case of the low pressure turbine at a location downstream of the location to which the air mixed at the first modulating valve was flowed and against the case at that downstream location for thermally varying the diameter of the case at that location.

4,513,568

METHOD FOR THE TRANSFORMATION OF THERMAL ENERGY INTO MECHANICAL ENERGY BY MEANS OF A COMBUSTION ENGINE AS WELL AS THIS NEW ENGINE

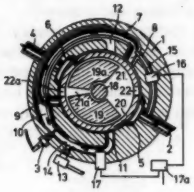
Roger Bajulaz, 825 Las Palmas Dr., Hope Ranch, Santa Barbara, Calif. 93110

Filed Nov. 18, 1982, Ser. No. 442,799

Claims priority, application Switzerland, Sep. 24, 1982, 5648/82

Int. Cl.³ F02G *1/00*

U.S. Cl. 60—39.6 **27 Claims**



1. Method for the transformation of thermal energy into mechanical energy by means of a combustion engine comprising a body provided with admission and exhaust ducts, as well as at least one member movable within said body defining at least one chamber having a variable volume, comprising establishing a cycle of more than four strokes, at least four of these strokes comprising:

a. compressing air contained in the variable volume chamber, through a reduction of the volume of said chamber, into a preheating chamber;

b. expanding the variable volume chamber through the expansion of the hot air contained in the preheating chamber;

c. compressing, through a reduction of the volume of the variable volume chamber, the hot expanded air in said variable volume chamber, into a combustion chamber in which fuel is introduced and causing the combustion of the mixture thus obtained; and

d. expanding the variable volume chamber through the expansion into said chamber of the combustion gases at high temperature and high pressure from the combustion chamber.

4,513,569

COMBUSTION LINER SUPPORT FOR COMBUSTION APPARATUS

Masafumi Sasaki, Zushi; Susumu Kashiwagi, and Takanori Hiyoshi, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 7, 1983, Ser. No. 464,482

Claims priority, application Japan, Feb. 15, 1982, 57-21316

Int. Cl.³ F02C *7/20*

U.S. Cl. 60—39.31 **5 Claims**

1. A combustion liner support for a combustion apparatus having a combustion outer casing and a fuel injection nozzle attached thereto, comprising:

a one-piece annular support bracket encircling said fuel injection nozzle and having an end secured to said combustion outer casing and the other end receiving therein an annular axial end of a combustion liner;

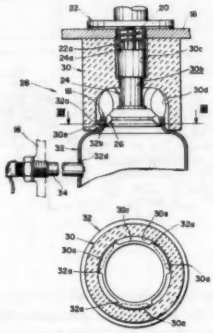
means for providing a plurality of outward projections to said combustion liner end;

means for providing a plurality of inward projections to said other end of said annular supporting bracket;

said combustion liner outward projections being releasably engageable with said supporting bracket inward projections when said combustion liner is inserted into said other end of said support bracket;

a pusher ring cooperating with said supporting bracket inward projections to interpose therebetween said combustion liner outward projections; and

biasing means for resiliently urging said pusher ring against said supporting bracket inward projections so that said combustion liner is resiliently supported on said combustion liner outer casing;



in which said fuel injection nozzle includes a slidable outer sleeve slidably received in a nozzle holder attached to said combustion outer casing, said injection nozzle outer sleeve has a rim adjacent the combustion liner side end thereof, said combustion apparatus further including a swirler of annular configuration fitted on said combustion liner side end of said injection nozzle outer sleeve in a manner to abut at the inner peripheral portion thereof onto said rim to that it is movable together with said injection nozzle outer sleeve, and in which said pusher ring is provided to the outer periphery of said swirler and formed integral therewith, said pusher ring being in the form of having a cylindrical body portion and an annular flange portion extending radially outwardly.

4,513,570

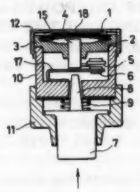
MANUAL RESET TYPE BIMETAL THERMOSTAT

Yasuhisa Yoshida, and Toshio Ohi, both of Tokyo, Japan, assignors to Nippon GT Corporation, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 487,931

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—529 **5 Claims**



1. A manual reset type bimetal thermostat where a reversible plate is substantially contiguous with a disc type bimetal which can reverse in response to temperature change, characterized in that at least either of said reversible plate and said bimetal is

provided with an air passage hole, said air passage hole being substantially free from solid structure in said thermostat.

4,513,571

METHOD OF SUPERCHARGING INTERNAL COMBUSTION ENGINES USING EXHAUST TURBOCHARGERS WITH VARIABLE EXHAUST GAS SWALLOWING CAPACITY

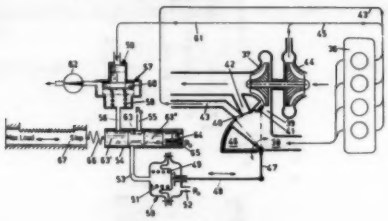
Ernst Jenny, Baden; Andreas Mayer, Niederrohrdorf, and Peter Moser, Boppelsen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 16, 1982, Ser. No. 418,601

Claims priority, application Switzerland, Sep. 22, 1981, 6093/81

Int. Cl.³ F02B *37/12*

U.S. Cl. 60—603 **7 Claims**



1. A method for supercharging an internal combustion engine of a vehicle by an exhaust gas turbocharger having a plurality of engine exhaust gas paths which include a turbine inlet path of variable area for directing at least some engine exhaust to a turbine of said turbocharger and a waste gate duct for selectively directing at least some engine exhaust so as to bypass said turbine, said waste gate duct serving to blow down surplus exhaust gas from said engine under a high engine load, which comprises:

operating the engine as a naturally aspirated engine in a lower load region;

holding fully open said engine exhaust gas paths once the engine is operating in said lower load region;

closing said exhaust gas paths to a minimum operational value of flow area such that said variable turbine inlet area has a minimum operational value and the remainder of said plurality of exhaust gas paths are closed when a medium load operating condition of said engine is attained; and

continuously opening the flow area of said variable turbine inlet area and subsequently opening a section of the waste gate duct upon the occurrence of an increasing load on the engine until a maximum predetermined permissible mean combustion pressure is attained.

4,513,572

METHOD OF RECOVERING ENERGY IN A POWER GENERATOR AND POWER GENERATOR FOR CARRYING OUT THE SAID METHOD

Pierre L. Bonnaud, Carrieres sur Seine, France, assignor to Societe d'Etudes de Machines Thermiques, S.E.M.T., Carrieres sur Seine, France

Filed Mar. 29, 1983, Ser. No. 479,995

Claims priority, application France, Apr. 12, 1982, 82 05800

Int. Cl.³ F01K *23/10*

U.S. Cl. 60—618 **5 Claims**

1. A method for recovering energy from exhaust gases discharged from an exhaust manifold of a turbocharged internal combustion engine, the method including delivering a flow of exhaust gases from the exhaust manifold of the engine to an inlet of an exhaust gas turbine, exiting a flow of the exhaust gases from an outlet of the exhaust gas turbine, driving a supercharging air compressor by the exhaust gas turbine, delivering a flow of compressed air from an outlet of the supercharging air compressor to an intake manifold of the engine, withdrawing a portion of the total flow of compressed air from the outlet of the compressor, and introducing the withdrawn portion of the flow of compressed air into the flow of exhaust gases before exit of the exhaust gases from the outlet of the exhaust gas turbine, wherein the improvement comprises:

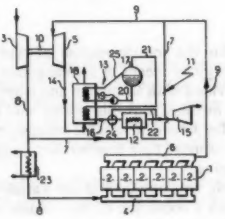
passing the exhaust gases, after their exit from the outlet of the exhaust gas turbine, through an auxiliary fluid vapor generator in heat exchanging relation to an auxiliary fluid in said vapor generator;

delivering a flow of vaporized auxiliary fluid from an auxiliary fluid outlet of the auxiliary fluid vapor generator;

passing said flow of vaporized auxiliary fluid in heat exchanging relation to the withdrawn portion of the flow of compressed air during at least low load operation of the engine for heating said withdrawn portion of the flow of compressed air before the latter is introduced into the flow of exhaust gases; and

then delivering said flow of vaporized auxiliary fluid to an inlet of an auxiliary vapor turbine.

4. Apparatus for recovering energy from exhaust gases discharged from an exhaust manifold of a supercharged internal combustion engine including a supercharging air compressor having an outlet connected to an intake manifold of the engine, an exhaust gas turbine drivingly coupled to the supercharging air compressor, the exhaust gas turbine having an inlet connected to the exhaust manifold of the engine and an outlet, a bypass passage connected from the outlet of the supercharing air compressor to the exhaust gas turbine upstream of the outlet of said turbine for withdrawing a portion of the flow of compressed air from the supercharging air compressor and introducing said withdrawn portion into the flow of exhaust gases, and an energy recovery device having an exhaust gas inlet connected to the outlet of the exhaust gas turbine, wherein the improvement comprises:



said energy recovery device comprises an auxiliary fluid vapor generator having an exhaust gas side disposed in heat transferring relation to an auxiliary fluid side, said exhaust gas inlet of the energy recovering device communicating directly with the exhaust gas side, said auxiliary fluid side of the vapor generator having an auxiliary fluid inlet, for connection to a source of auxiliary fluid, and an auxiliary fluid vapor outlet;

an auxiliary vapor turbine having an inlet coupled to the auxiliary fluid vapor outlet of the auxiliary fluid vapor generator via an auxiliary fluid conduit; and

a heat exchanger having a heating fluid side inserted in the auxiliary fluid conduit and a heated fluid side inserted in said bypass passage, for transferring heat from a flow of vaporized auxiliary fluid to the withdrawn portion of the flow of compressed air before delivery of the vaporized auxiliary fluid to the inlet of the auxiliary vapor turbine.

4,513,573
SYSTEM FOR TREATING AND RECOVERING ENERGY FROM EXHAUST GASES

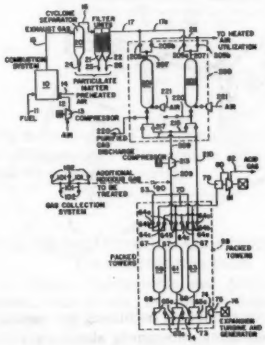
Harald F. Funk, 68 Elm St., Murray Hill, N.J. 07974

Continuation of Ser. No. 205,348, Nov. 10, 1980, Pat. No. 4,411,136, and a continuation-in-part of Ser. No. 962,103, Nov. 17, 1978, Pat. No. 4,265,088, which is a continuation-in-part of Ser. No. 674,219, Apr. 6, 1976, Pat. No. 4,126,000, which is a continuation-in-part of Ser. No. 565,045, Apr. 4, 1975, Pat. No. 3,970,524, which is a continuation-in-part of Ser. No. 486,562, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 252,610, May 12, 1972, abandoned. This application Sep. 9, 1983, Ser. No. 530,650

The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.

Int. Cl.³ F01K *21/00, 3/00*

U.S. Cl. 60—648 6 Claims



1. In a power generating system for producing energy from steam, including furnace means for generating thermal energy-containing hot gases containing environmentally harmful components and boiler means for utilizing the thermal energy of the hot gases for converting feed water to steam, the improvement comprising:

boiler means consisting essentially of economizer means, superheater means, reheater means, convection and radiation heater means, said hot gases containing environmentally harmful components exiting said boiler means after passage through said economizer means;

means for treating said hot gases containing environmentally harmful components to separate said components and recover at least a portion of the residual thermal energy of said gases; and

means for directing said hot gases to said treating means from said economizer means without substantial cooling therebetween;

said treating means comprising

(a) separator means for removing particulate matter from said hot gases;

(b) first heat exchange means for passing said gases into direct heat exchange relationship with a relatively cool, relatively high heat capacitance solid material to exchange heat between said gases and said solid material, whereby said hot gases are passed through said first heat exchange means to concurrently cool said gases and heat said solid material;

(c) means for separating environmentally harmful components of said cooled gases from the balance thereof by separating the cooled gases into less volatile and more volatile components;

(d) second heat exchange means for passing a fluid into direct heat exchange relationship with a relatively hot, relatively high heat capacitance solid material to exchange heat between said fluid and said material, whereby a heat transfer fluid is passed through said second heat exchange means to concurrently cool said solid material and heat said fluid.

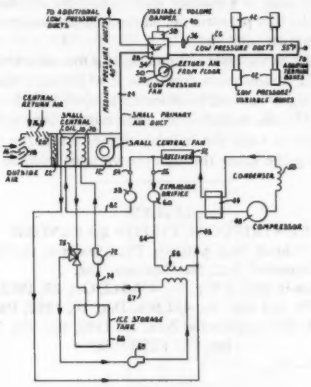
4,513,574
LOW TEMPERATURE AIR CONDITIONING SYSTEM AND METHOD

Norman G. Humphreys, Kansas City, Mo., and Raymond H. Dean, Shawnee Mission, Kans., assignors to Tempmaster Corporation, North Kansas City, Mo.

Filed Apr. 30, 1984, Ser. No. 605,272

Int. Cl.³ F24F *13/00, 7/00*

U.S. Cl. 62—59 6 Claims



1. In a system for distributing conditioned air in a building at a preselected temperature, the combination of:

a primary air distribution duct extending in the building;

a primary cooling coil for cooling air to a low temperature below said preselected temperature;

a secondary cooling coil;

a refrigeration system for cooling said primary coil, said refrigeration system including a compressor having a suction side and a discharge side and a condenser connected with the discharge side of said compressor for condensing refrigerant compressed by the compressor;

an ice storage tank for holding ice;

a heat exchanger arranged in parallel with said primary cooling coil to produce a fluid temperature at or below 32° F. when refrigerant is directed through said heat exchanger at a temperature below 32° F.;

valve means for directing refrigerant to said primary coiling coil or to said heat exchanger;

a fluid line passing through said heat exchanger and said ice storage tank;

pump means for pumping fluid through said fluid line;

a cold water line passing through said ice storage tank and said secondary cooling coil;

pump means for pumping water through said storage tank and secondary coil to cool the latter, whereby the refrigerant can be directed through said heat exchanger to produce ice during off peak times and the refrigerant can be directed to said primary cooling coil during peak times and said secondary coil can receive cold water during peak times to provide supplemental cooling and to permit a higher temperature on the suction side of the compressor during peak times;

a central fan operable to force air past said primary cooling coil and said secondary cooling coil and through said primary duct at a preselected pressure level, thereby supplying conditioned air through the primary duct at said low temperature and said preselected pressure level;

a plurality of branch ducts each connected with said primary duct to receive the low temperature air therefrom, each branch duct serving a space in the building and extending to said space to deliver conditioned air thereto;

a low pressure fan for each branch duct having an inlet side receiving return air from the space served by the branch duct and a discharge side delivering the return air to the branch duct for mixing therein with the low temperature air, each low pressure fan delivering air downstream therefrom in the branch duct at a low pressure level below said preselected pressure level;

means in each branch duct for controlling the relative amounts of low temperature and return air mixed in the branch duct in a manner to maintain the air downstream from the low pressure fan substantially at said preselected temperature; and

a plurality of variable volume outlets for each branch duct located downstream from the low pressure fan for discharging air at said preselected temperature to the space served by the branch duct, each outlet being individually variable to vary the volume rate of discharge of the air entering the space through the variable volume outlet.

4,513,575

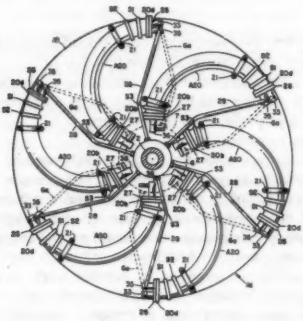
CENTRIFUGAL PISTON EXPANDER

Edwin W. Dibrell, San Antonio, Tex., assignor to Centrifugal Piston Expander, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 436,412, Oct. 25, 1982, Pat. No. 4,449,379, and Ser. No. 451,606, Dec. 20, 1982, Pat. No. 4,420,945. This application Nov. 22, 1983, Ser. No. 554,408

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—86 **9 Claims**



1. Apparatus for extracting energy from a pressured gas comprising: a body rotatable about an axis; power means for rotating said body; a cylinder element secured to said rotating body; said cylinder element defining an elongated fluid pressure chamber; a free piston movable longitudinally in said fluid pressure chamber; said cylinder element being fixed on said rotatable body with the path of movement of said free piston extending from a position proximate to said axis to a position remote from said axis; whereby centrifugal force will move said free piston to said remote position; said path of movement being substantially non-radially disposed relative to said axis of rotation; inlet valve means communicating between a source of pressured gas and the remote end of said cylinder element; means for opening said inlet valve means only when said free piston is adjacent said remote position to receive a charge of pressured gas in said fluid pressure chamber, thereby moving said free piston inwardly toward said rotational axis; exhaust valve means communicating with said fluid pressure chamber and operable only when said free piston approaches said proximate position; and means on the radially inner end of each said cylinder element for opposing the inward movement of said free piston by a trapped gas column to thereby stop the inward movement of said free piston.

4,513,576

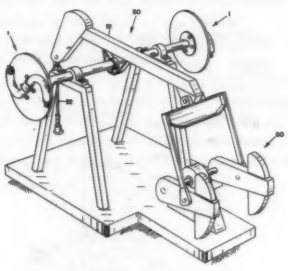
GAS PRESSURE OPERATED POWER SOURCE

Edwin W. Dibrell, and Charles D. Wood, both of San Antonio, Tex., assignors to Centrifugal Piston Expander, Inc., San Antonio, Tex.

Filed Dec. 12, 1983, Ser. No. 560,305

Int. Cl.³ F25D *9/00*

U.S. Cl. 62—87 **21 Claims**



1. Apparatus for producing oscillating movement of a body mounted for oscillating movement about an axis; cylinder means defining an elongated fluid pressure chamber having a longitudinal axis; means for rigidly mounting said cylinder means on said body with one end of said fluid pressure chamber being radially remote from said oscillation axis; said longitudinal axis being substantially non-radial throughout its length; said fluid pressure chamber having a uniform cross-section throughout its length; a free piston mounted in said fluid pressure chamber for sliding sealable movement throughout the length thereof; first and second valve means responsive to the position of said free piston for respectively supplying pressured gas to the ends of said fluid pressure chamber; third and fourth valve means responsive to the position of said free piston for respectively exhausting expanded gas from said fluid pressure chamber; thereby causing said piston to continuously reciprocate from one end to the other of said fluid pressure chamber and produce continuous oscillating movements of said body about said axis.

4,513,577

EVAPORATOR AND METHOD OF OPERATION

Neill R. Wilson, and Susan E. Wilson, both of P.O. Box 538, Berryville, Va. 22611

Filed Nov. 19, 1982, Ser. No. 443,025

Int. Cl.³ F25D *17/06;* **F28D** *3/00*

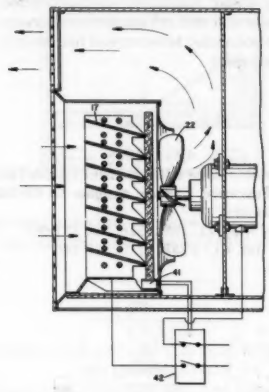
U.S. Cl. 62—91 **12 Claims**

1. A method of cooling moisture containing air comprising:

passing said air over a metal surface which is cooled by evaporation of a refrigerant, whereby the moisture condenses on said surface;

conducting said condensate to a point on the downstream air side of said surface;

thereafter dispersing said condensate whereby said condensate re-evaporates into said air; and,



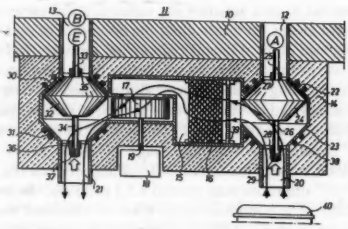
stopping the evaporation of said refrigerant for a period of time when an excess of condensate builds up on the downstream air side of said surface.

4,513,578

WEIGHT-MONITORED AIR-CONDITIONER CHARGING STATION

Robert H. Proctor, Cockeysville, and Arthur G. Hobbs, Jr., Hampstead, both of Md., assignors to Murray Corporation, Cockeysville, Md.

Filed May 23, 1983, Ser. No. 497,167
Int. Cl.³ F25B *45/00*
U.S. Cl. 62—149 **12 Claims**



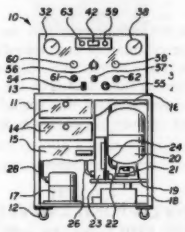
1. In an air-conditioner charging station, the combination of:
(a) a powered vacuum pump for evacuation of an air-conditioner;
(b) a reservoir of oil under pressure,
(c) a reservoir of refrigerant under pressure,
(d) conduit means and electrically operated valve means for selectively connecting said pump and each of said reservoirs to the air-conditioner to be serviced,
(e) weighing means, common to both said reservoirs, for sensing the combined weight thereof and for producing an output signal proportional to the combined weights of said reservoirs,
(f) electronic sequencing means operatively associated with said valve means and said weighing means for receiving said output signal for monitoring weight loss from said reservoirs as oil or refrigerant is discharged therefrom and for generating signals for controlling said valve means,
(g) adjustable weight differential input means operatively connected to said sequencing means for introducing into said sequencing means selected values representative of preselected weight of refrigerant and oil to be discharged from said reservoirs, and
(h) means for initiating operation of said sequencing means to receive and monitor said weighing means output signal and to provide signals to said control valve means for sequentially charging a preselected weight of oil from said oil reservoir and then a preselected weight of refrigerant from said refrigerant reservoir into the air-conditioner.

4,513,579

METHOD AND ARRANGEMENT FOR MAINTAINING A FROST-FREE FREEZER

Karl F. Andersson, Åkersberga, and Bolik A. G. Eriksson, Johanneshov, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

PCT No. PCT/SE82/00284, § 371 Date May 16, 1983, § 102(e) Date May 16, 1983, PCT Pub. No. WO83/01293, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 16, 1982, Ser. No. 503,154
Claims priority, application Sweden, Sep. 29, 1981, 8105757
Int. Cl.³ F25D *17/04*
U.S. Cl. 62—176.2 **8 Claims**



1. An arrangement in a freezer having a chamber in which refrigerated surfaces collect frost comprising: a duct, a moisture-absorbing regenerable filter mounted in said duct, a fan in said duct, said fan being arranged to circulate freezing chamber air through said filter in order to lower the humidity of the freezing chamber air and to counteract frost forming therein, a plurality of communication channels beetween said freezing chamber and said duct and between said duct and ambient air, and valve means arranged to open and close selected communication channels forming a first flow path between said freezing chamber and said duct, and to selectively bring said duct into communication with ambient air through other of said communication channels forming a second flow path, said fan being arranged to circulate said ambient air through the duct and thereby through the filter, and means for heating said filter to regenerate it when said ambient air is circulating through said filter, said heating means being arranged ahead of said valve means in said second flow path.

4,513,580

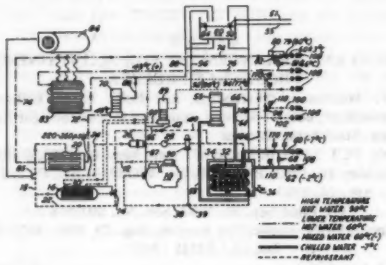
COMBINED REFRIGERATION AND HEATING CIRCUITS

Donald C. Cooper, 124B Reigate Rd., Ewell, Surrey, England

Filed Oct. 18, 1983, Ser. No. 543,072
Claims priority, application United Kingdom, Oct. 21, 1982, 8230081
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—183 **8 Claims**

1. A combined refrigeration and heating circuit comprising a refrigerant, a compressor for compressing the refrigerant in gaseous form, a condenser, means for circulating the compressed refrigerant to the condenser where it is condensed to a liquid, an evaporator, means for circulating the liquid refrigerant to the evaporator where it becomes a gas, means for circulating the evaporated refrigerant gas back to the compressor, a

heating circuit for circulating heat-transfer fluid heated by heat taken from the condenser, sensing means for sensing the amount of heat being taken from the condenser, cooling means responsive to said sensing means for additionally cooling the refrigerant to ensure complete condensation thereof if insufficient heat is being taken from the condenser to allow condensation of refrigerant to be completed therein, a de-superheater



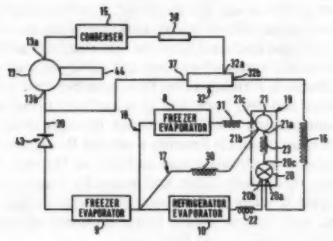
arranged between the compressor and the condenser and circulation means for circulating heat transfer fluid past the de-superheter to heat it to a temperature higher than the temperature of the heat-transfer fluid heated by the condenser, wherein the refrigerant is different from that for which the compressor was designed and chosen to obtain a higher condensation temperature.

4,513,581

REFRIGERATOR COOLING AND FREEZING SYSTEM

Norihiro Mizobuchi; Keiji Furukawa, and Takeshi Motoyama, all of Osaka, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 24, 1984, Ser. No. 573,345
Claims priority, application Japan, Mar. 9, 1983, 58-38728
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—197 **6 Claims**



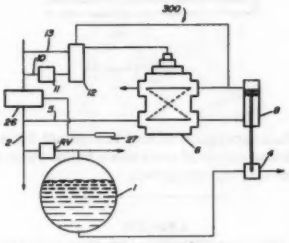
1. A refrigerator cooling and freezing system comprising:
a compressor;
a condenser connected to said compressor for condensing refrigerator from said compressor;
a refrigerator evaporator connected to said condenser for receiving flow of refrigerator to cool said refrigerant compartment;
a first freezer evaporator serially connected to said refrigerator evaporator and to said compressor so that refrigerator flowing therethrough is returned to said compressor;
means defining a first bypass path in parallel with said refrigerator evaporator;
a second freezer evaporator;
means defining a second bypass path in parallel with said refrigerator evaporator and said first path and directing flow through said second freezer evaporator;
selection means for controlling flow of refrigerator through said refrigerator evaporator, said first bypass path or said second bypass path;
a differential pressure regulating valve connected between said condensor and said refrigerator evaporator and non-return valve connected between said first freezer evaporator and compressor.

4,513,582

EXPENDABLE REFRIGERATION CONTROL

David Garside, Rosemere, Canada, assignor to 128980 Canada Inc., Claire, Canada

Filed May 11, 1982, Ser. No. 377,068
Int. Cl.³ F25B *41/04, 19/00*
U.S. Cl. 62—222 **6 Claims**



1. An apparatus for controlling the opening and closing operation of a refrigerant flow valve dispensing refrigerant fluid fed thereto from a reservoir, using the inherent gas pressure from the reservoir, comprising in combination:
(a) an actuator operably connected to said flow valve for opening and closing the same;
(b) valve means including operator mechanism, operably connected to said actuator for activating the same; and
(c) control means for controlling the operation of said valve means, said control means comprising circuitry having at least one pressure operated oscillating pulse generator unit and a counting means operably connected to count the oscillations and thereby control the valve means operator mechanism, whereby facility to vary the ratios of "on" to "off" timing within a ratio range of 1:1 to 99999:1 are provided, normal maximum differential between the "on" and "off" durations may exceed a 5:1 ratio and the overall duration of a complete cycle may be extended beyond about two minutes without incurring the risk of hysteresis in the valve with consequential failure of the control function.

4,513,583

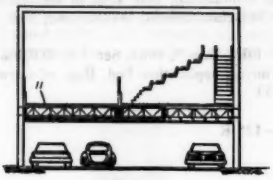
AIR COOLED ICE RINK CONSTRUCTION

Allan E. Watt, 414 Montgomery Ave., Riverview, New Brunswick, Canada E1B 1Z8

Filed Jun. 6, 1983, Ser. No. 501,247
Claims priority, application Canada, Jul. 26, 1982, 408052
Int. Cl.³ A63C *19/10*
U.S. Cl. 62—235 **7 Claims**

1. An ice rink comprising:
(a) a floor means having a top surface for supporting ice thereon;
(b) insulating means positioned beneath and substantially coextensive with said floor means;
(c) cooling means intermediate the top surface of said floor means and said insulating means;

(d) support means for supporting said floor means, said cooling means and said insulating means at a level above



the ground sufficient to allow ambient air to circulate between such insulating means and the ground.

4,513,584

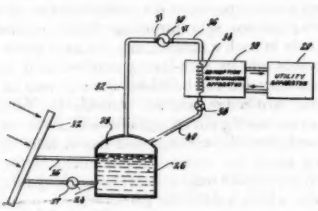
METHOD AND APPARATUS FOR ABSORPTION REFRIGERATION

John F. Woyke, 132 Long Lots Rd., New Canaan, Conn. 06840

Continuation-in-part of Ser. No. 111,090, Jan. 10, 1980, abandoned. This application Jul. 15, 1981, Ser. No. 283,510

Int. Cl.³ A63C *19/10*

U.S. Cl. 62—235.1 **1 Claim**



1. An improved absorption refrigeration apparatus comprising:

a. an absorption refrigeration means having a generator in heat transfer relationship with an inlet fluid and an evaporator, said refrigeration means adapted to receive thermal energy supplied to said generator by said inlet fluid and to utilize said thermal energy for causing cooling at said evaporator;

b. said refrigeration means adapted to operate efficiently at and above an inlet fluid temperature T_1;

c. an enclosed vessel having a heat transfer medium and a rotary pump positioned therein;

d. said pump dividing said vessel into first and second relatively low and high pressure chambers respectively;

e. means for conveying said inlet fluid to said second chamber in heat transfer relationship therewith for heating said inlet fluid at least to the temperature T_1;

f. a solar energy source;

g. means for providing a heat transfer relationship between said solar energy source and said first chamber for heating said heat transfer medium in said first chamber to a temperature T_0 which is less than said temperature T_1;

h. means for imparting intermittent rotary motion to a pump piston for causing said pump to successively draw and vaporize said medium from said first chamber, compress said vaporized medium, and discharge said compressed vaporized medium to said second chamber; and,

i. said vessel including means for conveying said heat transfer medium in liquid form from said second to said first chamber.

4,513,585

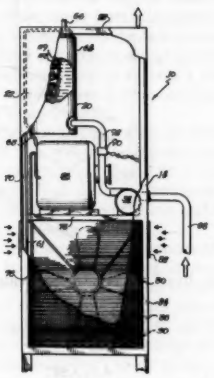
HOT WATER SYSTEM USING A COMPRESSOR

Richard Z. Maisonneuve, Shererville, Ind., assignor to Manoir International, Inc., South Holland, Ill.

Filed Jan. 12, 1981, Ser. No. 224,009

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.6 **5 Claims**



1. A conversion unit for an existing electric water heater having a hot water tank comprising:

refrigeration means having a compressor, a refrigerant metering device, an evaporator, and a condenser for a refrigerant,

conduit means for connection to an existing port in the tank for withdrawing water therefrom and for conveying water to the condenser, return conduit means for connection to an existing port in the tank for returning heated water to the hot water tank, a thermostatically controlled pump means operable independently of said hot water tank to circulate water through said refrigeration apparatus and said hot water tank,

a coiled water conduit in said condenser having a coil for receiving water being pumped through the conduit means and for flowing water through the condenser,

a coiled refrigerant conduit having a coil adjacent the water conduit in heat exchange relationship therewith to heat the water being pumped through said coil of said water conduit, each of said water and refrigerant conduits having separate walls so that a leak in the refrigerant conduit wall will not contaminate the water in the water conduit.

4,513,586

COMBINATION COMPRESSOR SUPPORT AND DRAIN PAN

William B. Jennings, Collierville, Tenn.; Edward B. Shelton, Liverpool, and Richmond S. Hayes, Jr., Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,392

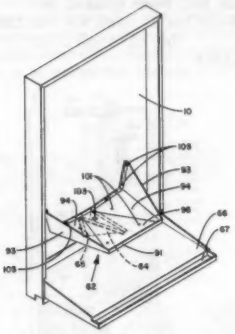
Int. Cl.³ F25D *23/12*

U.S. Cl. 62—263 **8 Claims**

1. A heat exchange unit including a refrigeration circuit having a compressor and an outdoor heat exchanger, said unit being divided by a vertical partition into an indoor section and an outdoor section wherein the compressor and outdoor heat exchanger are located, which comprises:

a horizontally extending support means secured to the partition a selected distance from the bottom of the unit, said support means including a bottom surface for supporting a compressor and for collecting condensate; and

a drain bracket secured to the partition and positioned to buttress the support means, said drain bracket additionally



acting to divert the condensate collected by the support means.

4,513,587

EVAPORATOR PARTICULARLY SUITABLE FOR AIR CONDITIONERS IN AUTOMOTIVE VEHICLES

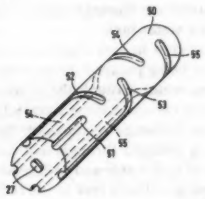
Bohumil Humpolik, Ludwigsburg, and Karl-Heinz Staffa, Stuttgart, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 394,876, Jul. 2, 1982, Pat. No. 4,430,868. This application Nov. 22, 1983, Ser. No. 554,302

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136374; Mar. 16, 1982, 8207265[U]

Int. Cl.³ F25B *41/06*

U.S. Cl. 62—515 **22 Claims**



1. An evaporator, comprising:

a connector member;

a Venturi distributor connected to said connector member for receiving and distributing a coolant, wherein said Venturi distributor divides said coolant into a plurality of streams;

a plurality of channels formed in a body which comprises an insert for said connector member for conducting the coolant streams from said Venturi distributor, said channels corresponding in number to said streams with each channel being positioned to receive one of said streams from said Venturi distributor;

a plurality of evaporator pipes connected to said connector member in parallel flow arrangement, said pipes corresponding in number to said channels with each pipe being connected to one of said channels, thereby forming a continuous coolant flow path from said Venturi distributor via said channels to said evaporator pipes; and

a collection chamber formed in said connector member for receiving said coolant from said pipes.

4,513,588

FLAT KNITTING MACHINE FOR THE PRODUCTION OF KNITTED PIECES WITH INTARSIA

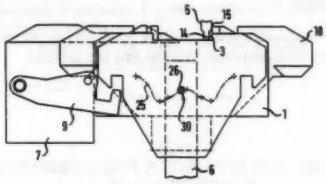
Albert Lutz, Westhausen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik, Westhausen, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 559,066

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245233

Int. Cl.³ D04B *15/52*

U.S. Cl. 66—126 R **9 Claims**



1. A flat knitting machine for the production of knitted pieces with intarsia, comprising a yarn guide with a yarn guide sheave mounted for vertical displacement on a yarn guide box, and a slider mounted for horizontal displacement on the yarn guide box and provided with at least two entraining edges at different vertical positions for engagement by an entrainer for the yarn guide box, said entraining edges co-operating with the yarn guide in such a manner that the yarn guide is lowerable downwards into its yarn-laying position with the yarn guide box stationary and can be raised upwards into its rest position from the yarn-laying position, wherein the yarn guide comprises an entraining pin engageable with a curved track which is connected to the carriage and has at least three different working levels for vertical displacement of the yarn guide, wherein the curved track comprises an elongate curved slot in the slider which guides the entraining pin positively in both directions with the vertical movement of the yarn guide, and wherein the elongate curved slot is formed such that with a movement of the slider relative to the yarn guide box from one lateral end position to the other lateral end position the yarn guide sheave

(a) is lowered from its uppermost rest position to a lowermost loop position below the yarn-laying position,

(b) is raised from this loop position to the yarn-laying position,

(c) is lowered from the yarn-laying position to a platting position between the yarn-laying position and the loop position, and

(d) is raised from the platting position to the rest position.

4,513,589

SOCK WITH SIMULATED LACE EDGE AND METHOD

Chester L. Kearns, Star, N.C., assignor to Montgomery Hosiery Mill, Inc., Star, N.C.

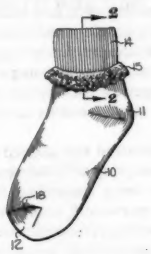
Filed Dec. 19, 1983, Ser. No. 562,978

Int. Cl.³ D04B *9/46*

U.S. Cl. 66—180 **7 Claims**

1. A sock including a foot, an upstanding and outwardly turned two-ply cuff, and a single-ply decorative simulated lace edge portion knit integrally with and extending downwardly from the lower edge of said two-ply cuff, a plurality of rounds of elastic yarn inlaid in the first course of said two-ply cuff said decorative edge portion including a plurality of successive courses forming adjacent wales of stitch loops, a purl side of all of said stitch loops facing outwardly, a knit side of all of said stitch loops facing inwardly, a selvage makeup along the lower edge, a first group of tuck stitch loops extending over a first group of multiple courses and being positioned in selected spaced-apart wales, plain stitch loops formed in the wales

between said first group of tuck stitch loops, a second group of tuck stitch loops extending over a second group of multiple courses and being positioned in selected spaced-apart wales which are offset relative to said selected spaced-apart wales in which said first group of tuck stitch loops are formed, and plain stitch loops formed in the wales between said second group of tuck stitch loops, said first and second groups of tuck stitch



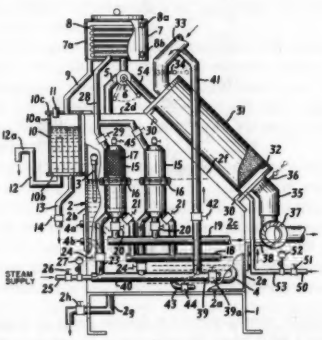
loops drawing said decorative edge portion together in a walewise direction and causing said plain stitch loops therebetween to be deformed inwardly and forming a checkerboardlike decorative pattern of alternating depressed fabric areas and tuck stitch loops, and said first group of tuck stitch loops drawing said selvage makeup upwardly in those wales in which said tuck stitch loops are formed and providing a scalloped lower edge on said decorative edge portion.

4,513,590

COMBINATION FILTER APPARATUS FOR USE WITH A DRY CLEANING MACHINE

Max Fine, Tamarac, Fla., assignor to Dual Filtrex, Inc., Tamarac, Fla.

Filed Mar. 8, 1983, Ser. No. 472,863
Int. Cl.[3] D06F *43/08*; B01D *5/00*
U.S. Cl. 68—18 C **15 Claims**



1. Combination filter apparatus for use with a dry cleaning machine using dry cleaning solvent comprising:

steam supply means,

condensing means having a cooling coil for condensing water and solvent vapor to convert it from vapor phase to liquid phase, said condensing means having a vapor inlet and a liquid outlet;

solvent-water separator means for separating water from solvent, said separator means having an inlet connected with the outlet of said condensing means, a discharge for water and a separate discharge for solvent,

absorption means comprising an absorption housing and a bed of activated carbon pellets in said housing, said housing having an air and vapor inlet, an air outlet, a steam inlet and a vapor outlet, means for passing air containing solvent vapor through said absorber means from said air inlet to said air outlet for removal of solvent vapor from the air by said activated carbon pellets, valve-controlled conduit means for supplying steam to said steam inlet to heat said activated carbon pellets to vaporize absorbed solvent, and valve-controlled conduit means for conducting steam and solvent vapor from said absorption means to said condensing means for condensation therein,

a plurality of like filter cartridge housings each of which is of a size and shape removably to receive a filter cartridge and has a dirty solvent inlet, a clean solvent outlet, and a steam inlet and a vapor outlet;

first valve controlled conduit means for selectively conducting dirty solvent from a dry cleaning machine to the dirty solvent inlet of one or more of said filter cartridge housings for passage through a filter cartridge in said housing and for conducting clean solvent from said clean solvent outlet to the dry cleaning machine;

valve controlled drain means at the bottom of each of said filter cartridge housings for draining solvent therein,

second valve controlled conduit means for conducting live steam from said steam supply means selectively to said steam inlet of one or more of said filter cartridge housings to vaporize solvent in a filter cartridge therein and for conducting steam and solvent vapor to said vapor inlet of said condensing means and discharge of the resulting solvent and water to said solvent-water separator means for separation of said solvent from said water,

said first valve controlled conduit means and second valve controlled conduit means including separate valves for each of said cartridge housings, whereby dirty solvent from said dry cleaning machine can be passed through a filter cartridge in one of said filter cartridge housings simultaneously with steam being conducted to another of said filter cartridge housings to vaporize solvent in a filter cartridge therein, and

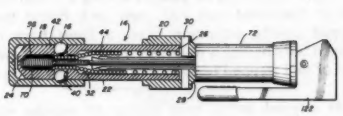
third valve controlled conduit means for selectively connecting said filter cartridge housings to said air and vapor inlet of said absorption means to draw air containing solvent vapor from said cartridge housings to said absorption means, said cartridge housing having valve-controlled vent openings for admission of air to said filter cartridge housings.

4,513,591

SPRING SECURITY LOCK

John H. Carlson, West Boylston, and Anthony J. Agbay, Auburn, both of Mass., assignors to Omco Inc., Holden, Mass.

Filed Oct. 31, 1983, Ser. No. 547,381
Int. Cl.[3] E05B *67/36*
U.S. Cl. 70—34 **18 Claims**



1. A high security lock comprising:

(a) a hollow cylindrical lock barrel having a closed front end and an apertured rear end, said lock barrel having a stepped axially extending bore, the front bore having a relatively small diameter and the rear bore having a relativley large diameter;

(b) said stepped barrel bore having an annular shoulder forming the junction between said front bore and said rear bore;

(c) at least two radially extending passageways running from an outer aperture in the exterior surface of said lock barrel

to an inner aperture in the front bore of said lock barrel, and a locking member mounted in each said passageway for limited movement therein, said locking member restrained from completely escaping through said outer aperture; and

(d) compression spring means including main and secondary compression springs, said main compression spring having a stepped axially extending exterior surface with a front narrow neck and a rear enlarged body, said main compression spring sized and shaped to slidably fit and reciprocate within said stepped bore of said lock barrel, said secondary compression spring having a stepped axially extending exterior surface with a front enlarged body and a rear narrow neck, said rear narrow neck of said secondary compression spring sized and shaped to coaxially and slidably fit within said front narrow neck of said main compression spring, the forward movement of said front narrow neck of said main compression spring being limited by said enlarged body of said secondary compression spring, said front exterior narrow neck portion of said normally unretracted main compression spring extending across and closing said inner aperture of each said passageway thereby forcing each said locking member outwardly to its locking position, said front exterior narrow neck portion of said main compression spring when retracted, moving rearwardly across and opening said inner aperture of each said passageway thereby permitting each said locking member to move inwardly to its unlocking position;

(e) the operation of an authorized key inserted in said lock causing said main compression spring to be rearwardly compressed and causing said enlarged body of said secondary compression spring to be held forwardly of said passageways, said rearwardly compressed main compression spring and said forwardly maintained secondary compression spring co-operating to permit said locking members to fall to their inward unlocking position.

4,513,592

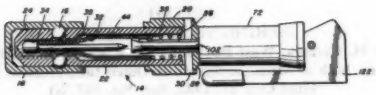
BARREL LOCK

Anthony J. Agbay, Auburn, Mass., assignor to Omco Inc., Holden, Mass.

Filed Oct. 31, 1983, Ser. No. 547,406

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **13 Claims**



1. A barrel lock comprising:

(a) a hollow cylindrical lock barrel having a closed front end and an apertured rear end, said lock barrel having a stepped axially extending bore, a front bore of said stepped bore having a relatively small diameter and a rear bore of said stepped bore having a relatively large diameter;

(b) said stepped barrel bore having an annular shoulder forming the junction between said front bore and said rear bore;

(c) at least two radially extending passageways running from an outer aperture in the exterior surface of said lock barrel to an inner aperture in said front bore of said lock barrel, and a locking member mounted in each said passageway for limited movement therein, said locking member restrained from completely escaping through said outer aperture;

(d) a compression spring having a stepped axially extending exterior surface with a front narrow neck and a rear enlarged body, said compression spring sized and shaped to slidably fit and reciprocate within said stepped bore of said lock barrel; and

(e) a center pin having an axially extending shaft with a front enlarged head, said shaft sized and shaped to coaxially and slidably fit within said front narrow neck of said compression spring, said front exterior narrow neck portion of said normally unretracted compression spring extending across and closing said inner aperture of each said passageway and thereby forcing each said locking member outwardly to its locking position, said front exterior narrow neck portion of said compression spring, when retracted, moving rearwardly across and opening said inner aperture of each said passageway thereby permitting each said locking member to move inwardly to its unlocking position;

(f) operation of an uathorized key inserted in said lock causing said compression spring to be rearwardly compressed, said enlarged head being maintained forwardly of said passageways, said rearwardly compressed compression spring and said forwardly maintained enlarged head cooperating to permit said locking members to fall to their inward unlocking position.

4,513,593

LOCK ARRANGEMENT

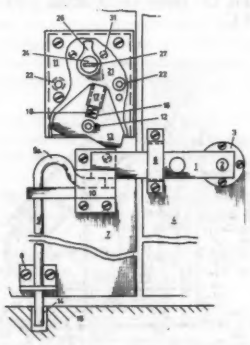
Norman H. Wilson, 8 Charnwood Rd., St. Kilda, Victoria, Australia 3122

Filed Nov. 4, 1982, Ser. No. 439,273

Claims priority, application Australia, Apr. 28, 1982, PF3763

Int. Cl.³ E05B *63/14*; E05C *7/00*

U.S. Cl. 70—114 **9 Claims**



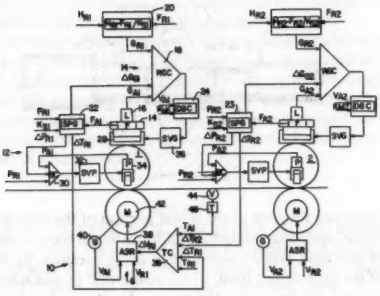
1. A locking arrangement for double gates or double doors comprising a latch plate for attachment to one gate or door of a pair and adapted to engagingly receive a latching bar attached to the other gate or door, a vertically slidable bolt member for attachment to said one gate or door and adapted in a downward position to engage a hole in a surface below said gates or doors and retain said one gate in a closed position, said bolt member having a projection adapted, in said downward position, for engagement with said latch plate, a locking bar adapted in a first locked position to retain said latching bar and said projection in engagement with said latch plate whereby both gates or doors are locked against opening and in a second locked position to retain only said projection in engagement with said latch plate whereby said one gate is locked against opening, and a lock mechanism for actuating said locking bar.

4,513,594

METHOD AND APPARATUS FOR COMBINING AUTOMATIC GAUGE CONTROL AND STRIP PROFILE CONTROL

Vladimir B. Ginzburg, Pittsburgh, and Sidney R. Snitkin, Leechburg, both of Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Aug. 22, 1983, Ser. No. 525,327
Int. Cl.³ B21B *37/06, 37/08*
U.S. Cl. 72—8 9 Claims



1. A method of combining automatic gauge control and strip profile control in a tandem rolling mill having at least an upstream and downstream four high roll stand with roll bending means comprising:

detecting a signal representative of the actual roll separating force in the upstream stand; and

utilizing that signal to maintain a constant roll force in the upstream stand through interstand tension control within predetermined limits and where the limit would be exceeded utilizing said signal to simultaneously control the roll gap for gauge control and control the roll bending for strip crown control.

7. A combination automatic gauge control and strip profile control for a rolling mill having at least an upstream and downstream tandem four high roll stand with roll bending means and screw down means associated therewith comprising:

a strip crown and gauge controller receiving a roll separating force signal from the upstream stand, comparing it to a reference force and generating a signal representing any difference between forces, said signal represented as an interstand tension correction signal, a strip tension controller receiving said interstand tension correction signal and adjusting the interstand tension to maintain a constant roll force on the upstream mill stand;

a gauge controller receiving a roll gap correction signal from the strip profile and gauge controller when the tension controller exceeds an established tension limit, said gap correction signal adjusting the screw down means to achieve the desired gauge; and

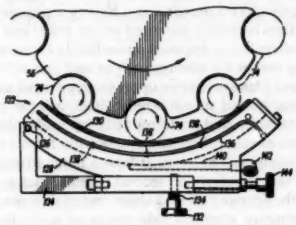
a roll bending pressure controller receiving a roll bending signal simultaneous with the gap correction signal when the tension correction signal exceeds said established limits, said roll bending signal adjusting the roll bending means to compensate for changes in rolling forces from the screw down adjustment.

4,513,595

METHODS OF NECKING-IN AND FLANGING TUBULAR CAN BODIES

Daniel S. Cvacho, 241 Kirkley Cir., Forest, Va. 24551

Division of Ser. No. 346,586, Feb. 8, 1982, Pat. No. 4,446,714.
This application Dec. 9, 1983, Ser. No. 559,809
Int. Cl.³ B21B *45/02*
U.S. Cl. 72—43 5 Claims



1. A method of effecting relubrication of a necked-in portion of a can body immediately following the necking in operation which comprises the steps of

a. supporting said can bodies in spaced, semicircular pockets of a rotary star wheel with the longitudinal axis of each can body being in a horizontal plane,

b. positioning an arcuate runner member containing a lubricating fluid sufficiently close to said rotary star wheel to engage a necked-in portion of each container in said pockets and effect rotation of the containers within the pockets,

(1) said arcuate runner member being sufficiently long to engage a plurality of containers simultaneously and also long enough to effect lubrication of the entire circumference of each container held within said pockets,

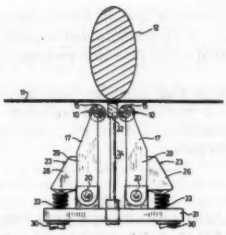
c. and delivering said can bodies to another star wheel for a second necking-in of said can bodies.

4,513,596

APPARATUS AND METHOD FOR FORMING SEAMED TUBE

George R. Usher, Brantford, Canada, assignor to Eagle Precision Tool Ltd., Canada

Continuation of Ser. No. 318,789, Nov. 6, 1981, abandoned, which is a continuation of Ser. No. 90,174, Jan. 11, 1979, abandoned. This application Feb. 1, 1983, Ser. No. 462,868
Claims priority, application Canada, Oct. 9, 1979, 337214
Int. Cl.³ B21D *39/02, 51/28, 5/01*
U.S. Cl. 72—51 2 Claims



1. A machine for forming a seamed tube of arcuate section from sheet material comprising an elongated mandrel of desired arcuate cross section having a longitudinal axis, an elongated support means having a longitudinal axis parallel to the longitudinal axis of said mandrel for supporting said sheet

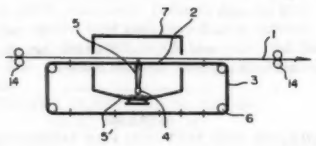
material adjacent said mandrel with the plane of said sheet tangential to an arc of said mandrel, first forming means comprising moveable platform means disposed below said support means for movement forward and away from said support means and disposed perpendicular to a plane passing through said longitudinal axes of said mandrel and said support means, a symmetrical pair of elongated roller means pivotally mounted on said platform on opposite sides of said plane, each of said roller means comprising an arm pivoted at one end on said platform means for pivotal movement about an axis parallel to the axis of said mandrel and having a plurality of axially aligned rollers rotatably mounted on the other end of said arm with the rollers being disposed immediately adjacent said plane and biasing means for biasing each of said pair of roller means towards said plane whereby upon movement of said platform means towards said mandrel said sheet will be pressed into engagement with said mandrel only by said rollers of each roller means as said rollers move upwardly from a point immediately adjacent said plane to at least a point adjacent a widest portion of said mandrel and second forming means operable to complete the forming of said sheet material around said mandrel by bringing opposed side edges of said sheet material adjacent one another and seaming means operable to form said opposed side edges into a longitudinal seam and thereby provide a seamed tube.

4,513,597

APPARATUS FOR REDUCING THE WATT LOSS OF A GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET

Tetsuo Kimoto, and Kiyoshi Orita, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,328
Claims priority, application Japan, Sep. 30, 1981, 56-153965
Int. Cl.³ B21J *22/10*
U.S. Cl. 72—53 **7 Claims**



7. An apparatus for projecting particles onto substantially linear selected portions of a grain-oriented electromagnetic steel sheet, thereby producing strain in the spot-formed regions of said selected portions of said grain-oriented steel sheet, comprising:

an endless conveyor having the grain-oriented electromagnetic steel sheet disposed on a portion thereof and operable for transferring said sheet through a predetermined path; wherein

said endless conveyor has slits formed therein with said slits being spaced at a predetermined distance from each other and elongated in the direction perpendicular to said path; and

means for projecting particles, said means being located adjacent said portion of said conveyor and oriented to project particles toward said portion of said conveyor and thereby said path.

4,513,598

METHOD AND APPARATUS FOR PRODUCING A BULGE IN THIN METAL MATERIAL

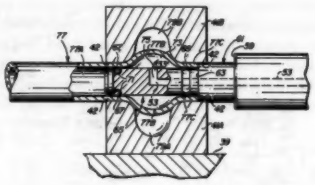
John J. Costabile, 7037 E. Moreland, Scottsdale, Ariz. 85257

Filed Jan. 27, 1982, Ser. No. 343,280
Int. Cl.³ B26D *26/02*
U.S. Cl. 72—62 **5 Claims**

3. A method of forming a ring-shaped bulge in a first portion of a piece of metal tube, said tube having a second portion adjacent to the first portion, said method comprising the steps of:

(a) inserting the first portion of said piece of tube into a cylindrical hole extending through a die apparatus so that the first portion of said tube is in aligned relation with a ring-shaped cavity around and in open communication with the cylindrical hole and defined by an annular enlargement in the wall of the cylindrical hole;

(b) applying a predetermined amount of pressure, by means of pressurized fluid inside said tube, to the inside wall of said tube to produce outward bulging of the first portion of said tube and thereby forming an initial portion of the ring-shaped bulge, the initial portion of the ring-shaped bulge extending into said ring-shaped cavity;



(c) after the forming of the initial portion of the ring-shaped bulge, applying a longitudinal force to the second portion of said tube, while continuing to apply pressure, by means of the pressurized fluid, to the inside wall of said tube, and thereby causing some of the second portion of said tube to slide into said ring-shaped cavity in order to allow the pressure of the fluid to cause further outward bulging of said initial portion into said ring-shaped cavity without thinning of said tube; and

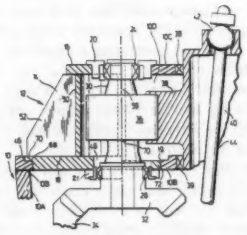
(d) simultaneously with step (c) preventing longitudinal movement of any of the first portion of said tube out of the ring-shaped cavity by causing a portion of the wall of said ring-shaped cavity contacting said initial portion of the ring-shaped bulge to resist longitudinal movement of any of the first portion of said tube out of said ring-shaped cavity.

4,513,599

STEEL MILL EDGER DRIVE SYSTEM

Thomas E. Harris, Point Claire, Canada, assignor to Dominion Engineering Works Limited, Lachine, Canada

Filed Sep. 15, 1983, Ser. No. 532,260
Claims priority, application Canada, Sep. 30, 1982, 412581
Int. Cl.³ B21B *31/08*
U.S. Cl. 72—238 **6 Claims**



1. In a drive modular unit for a roll of a steel mill edger, wherein said mill has a main casing and the roll is driven by a bullgear, said drive modular unit comprising:

a housing,

a shaft extending through said housing,

a pinion fixed to said shaft for engagement with said bullgear.

a drive gear fixed to said shaft on one side of said pinion,

a thrust bearing for said shaft on the side of said pinion remote from said drive gear, and

a bearing for said shaft intermediate said pinion and drive gear,

said two bearings being mounted in said housing,

said housing having a portion partially encircling the periphery of said pinion rigidly interconnected to an upper bearing mount for mounting said thrust bearing and a lower capsule element mounting said bearing intermediate said pinion and drive gear,

said shaft having an axis of rotation eccentric to the center of said lower capsule,

said capsule constructed and arranged to be received in said mating aperture in said main casing,

said housing further constructed and arranged to be secured to said casing along at least two angularly related separation planes oriented in a manner to permit movement of said drive modular unit axially of said shaft and then substantially radially to permit disengagement of said pinion from said bullgear and removal of said drive unit out of said main casing.

4,513,600

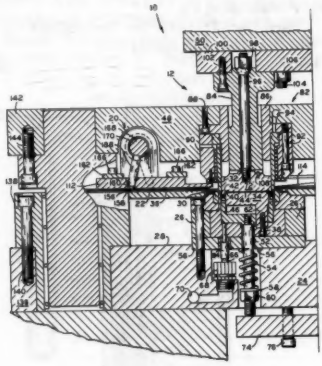
CAM ACTUATED EJECTOR FOR A SHELL PRESS

Arthur L. Grow, Versailles; Charles J. Gregorovich, St. Marys, and Donald N. Seyfried, New Bremen, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Jan. 3, 1983, Ser. No. 455,000

Int. Cl.³ B21D *45/00*

U.S. Cl. 72—345 **16 Claims**



1. In a press including a crankshaft for reciprocating a slide adapted for having tooling connected thereto and having a forming station in which said tooling forms a part, a part ejector mechanism for ejecting the part after forming, comprising:

an ejector member having an end portion, said ejector member reciprocating in the plane of the position of the part to be formed between a first position wherein said end portion is located outside the forming station and spaced from a part to be ejected from the forming station and a second position wherein said end portion is located in the forming station in a space normally occupied by a part to be ejected,

means for cyclically moving said ejector member from the first to the second position and from the second to the first position comprising a cam element having a contoured cam surface and a cam follower member in engagement with said cam surface, said cam element and said cam follower member being operatively connected to said ejector member, and

means synchronized with said crankshaft for moving said cam element and said cam follower member to cause relative movement between said cam surface and said cam follower member to reciprocate said ejector member between the first and second positions, said ejector member being moved by positive contact between said cam surface and said cam follower member when moving from the first to the second position and from the second to the first position in synchronism with said press slide.

4,513,601

METHOD FOR LOCALLY DEFORMING A ROUND TUBE INTO A TUBE COMPRISING PLANAR SURFACES AND A FORMING PUNCH FOR CARRYING OUT SAID METHOD

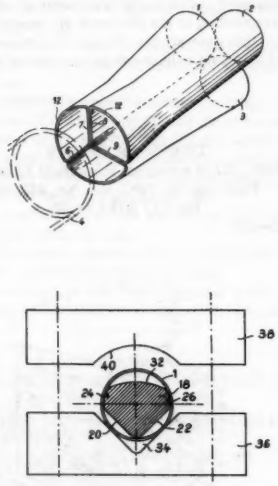
Alain Herbulot, Valentigney, France, assignor to Cycles Peugeot, Valentigney, France

Filed Sep. 29, 1982, Ser. No. 426,535

Claims priority, application France, Oct. 9, 1981, 81 19036

Int. Cl.³ B21D *41/00*

U.S. Cl. 72—398 **9 Claims**



1. A method for locally deforming a portion of a tube having an initial cylindrical wall of round section into a deformed tube portion having a wall which has parallel generatrices parallel to said initial cylindrical wall and an outer surface having a section in the shape of a sector of a circle, which circle has its centre substantially in axial alignment with the outer surface of said initial cylindrical wall, said method comprising axially inserting in the tube of round section an elongated punch having an outer surface which has parallel generatrices and a section in the shape of a sector of a circle with truncated corners between the circular part of the sector and the radii of the sector of the circle; placing said portion of the tube to be deformed containing the punch which has its generatrices parallel to said initial cylindrical wall on inclined lateral walls of a V-shaped groove of a die, which groove has parallel generatrices parallel to said initial cylindrical wall of the tubes, the V defining an angle identical to the angle defined by the radii of the sector of the punch; then applying on an outer free surface of said initial cylindrical wall of the tube a compression member which is also provided with a groove which has parallel generatrices parallel to said initial cylindrical wall of the

tube and a section having a radius identical to the radius of the circular outer surface of the deformed tube; exerting a force on the compression member until it causes the tube to contact the radiused part of the sector of the punch and causes the tube and punch to penetrate to an inner end of the V-shaped groove so that the tube conforms to the contour of a cavity defined by the grooves of the die and compression member and the section of the tube has said shape of a sector of a circle; then separating the compression member and the die; and axially withdrawing the punch from the tube.

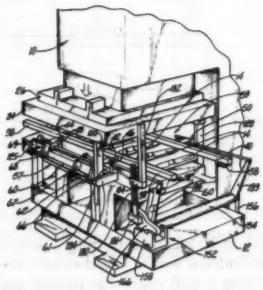
5. A forming apparatus comprising a die, a compression member and a forming punch for locally deforming a cylindrical tube having a wall of circular section, said punch having parallel generatrices and a section in the shape of a sector of a circle with truncated corners between the circular part of the sector and the radii of the sector of the punch, said truncated corners being inscribable within the circular inner surface of the wall of the tube of circular section and capable of centering the punch relative to the inner surface of the tube, the radii of the sector of the punch intersecting in a region which is also inscribable within said circular inner surface of the wall of the tube, said die having a V-section groove which has parallel generatrices, the branches of the V of the groove making an angle identical to the angle made by the radii of the sector of the punch, and the compression member defining a part-cylindrical groove having in section a radius of curvature larger than said radius of curvature of said sector of said punch to an extent corresponding to the thickness of the wall of said cylindrical tube, the generatrices of said V-section groove, said punch, and said part-cylindrical groove being parallel to one another.

4,513,602

TRANSFER DEVICE

Hugh M. Sofy, 201 Warrington, Bloomfield Hills, Mich. 48013

Filed Sep. 30, 1982, Ser. No. 432,080
Int. Cl.³ B21J *13/08*
U.S. Cl. 72—405 **8 Claims**



1. A work transfer device for moving a plurality of workpieces progressively from station to station in a generally longitudinal direction in a press of the type having a reciprocable part and a series of in-line work stations in which operations are performed on said workpieces, said transfer device comprising

work-holding jaw means disposed laterally in opposed relation on opposite sides of said stations; and

first and second actuator means operatively connected to and actuated by said reciprocable part of said press, said first actuator means being adapted to reciprocatingly actuate said jaw means toward and away from each other in generally lateral directions transversely of said work stations into and out of clamping engagement with workpieces therein, said second actuator means adapted to longitudinally and reciprocatingly actuate said jaw means while said jaw means are clampingly engaged with said workpieces in order to longitudinally index said workpieces simultaneously to the next adjacent stations,

said second actuator means having a rock shaft drivingly interconnected with said jaw means, cam and cam follower means drivingly connecting said reciprocable part of said press to a second actuator clutch assembly, said clutch assembly drivingly connecting said cam and cam follower means to said rock shaft, said second actuator clutch assembly including resiliently yieldable means for drivingly disconnecting said cam and cam follower means from said rock shaft in response to a first predetermined level of resistance to the longitudinal movement of said jaw means while said jaw means are clampingly engaged with said workpieces, thereby substantially preventing damage to said work transfer device in the event of the jamming of a workpiece therein, said resiliently yieldable means drivingly disconnecting said cam and cam follower means from said rock shaft in response to a second predetermined level of resistance to the longitudinal movement of said jaw means while said jaw means are clampingly disengaged from said workpieces, said second predetermined level being greater than said first predetermined level of resistance,

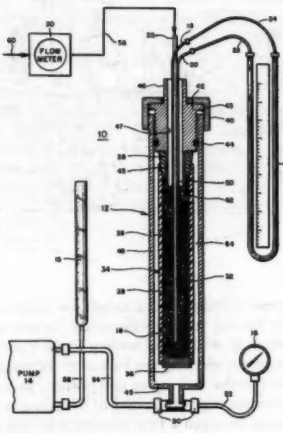
said second actuator clutch assembly and said cam and cam follower means being disposed laterally outward relative to said work stations and said rock shaft being vertically disposed below the level of said work stations, thereby permitting substantially unobstructed access to said work stations from an end area of said press.

4,513,603

SYSTEM FOR MEASURING CRUSH PROPERTIES OF A CATALYST

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 27, 1982, Ser. No. 453,369
Int. Cl.³ G01M *3/00*
U.S. Cl. 73—37 **25 Claims**



21. An apparatus for measuring crush properties of a particulate bed comprising:

pressure vessel;

particulate vessel situated within said pressure vessel, said particulate vessel comprising a deformable wall adapted to transmit external pressures applied thereto by a substantially incompressible first fluid to the interior of said particulate vessel;

pump coupled to said pressure vessel for introducing said first fluid into the space between said pressure vessel and

said particulate vessel, and pressurizing said first fluid to that sufficient to crush said particulate bed;

pressure gauge positioned to sense the pressure of said first fluid;

means for measuring the volume of said first fluid introduced by said pump into said space as a function of said pressure of said first fluid;

first tube extending from the exterior of said pressure vessel to a first location within said particulate vessel;

second tube extending from the exterior of said pressure vessel to a second location within said particulate vessel spaced apart from said first location;

means for establishing a pressure differential between said first and second tubes and for introducing a second fluid into said first tube in order to cause said second fluid to flow between said first and second locations;

first and second pressure sensor conduits extending from the exterior of said pressure vessel to second fluid pressure sensing points within said particulate vessel;

means for measuring the pressure differential between said first and second sensor conduits; and

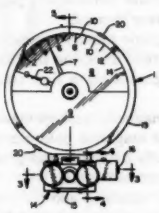
means for sealing said particulate vessel around said first and second tubes and said first and second conduits to substantially exclude said first fluid from the interior of said particulate vessel.

4,513,604

METHOD AND APPARATUS FOR INDICATING LEAKAGE IN COMPRESSED AIR LINE

Virgil L. Frantz, P.O. Box 1099, and Robert W. Bowles, 650 Boon St., both of Salem, Va. 24153

Filed Aug. 24, 1983, Ser. No. 526,008
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—39 **7 Claims**



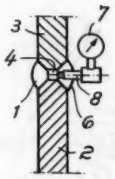
1. A differential flowmeter connectable to a compressed gas line upstream and downstream of a restriction in said line, said flowmeter comprising a casing, a dial on said casing, a pointer pivotally mounted on said dial and responsive to pressure differentials across said restriction for indicating said differentials on a scale on said dial, a rim attached to said casing forwardly of said dial, a concentric cylindrical track on an inside of said rim, a circumferentially gapped radially expandable resilient band compressed into and rotatable in said track relative to said rim, and indicator/pointer fixed to said band for swinging therewith along said scale, and a positioning pin fixed to and projecting radially from said band through and substantially contained against accidental actuation in a circumferential slot in said rim for manually shifting said indicator/pointer along said scale against yieldable resistance between said band and track.

4,513,605

METHOD AND DEVICE FOR TESTING WELDS OF THERMOPLASTIC PARTS

Manfred Hawerkamp, Altenrather Strasse 47, 5210 Troisdorf, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,484
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201515
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—40 **1 Claim**



1. A method of testing a weld (1) between a first (2) and a second (3) constructional part made of thermoplastic material, the first and second parts each having edges with two opposite sides and the weld extending from one of the two opposite sides to the first part to one of the two opposite sides of the second part, comprising:

establishing a space between the edge of the first part (2) and the edge of the second part (3) before the weld to be tested (1) is formed;

forming an additional weld (6) between the other of the two opposite sides of the first part (2) and the other of the two opposite sides of the second part (3), the additional weld (6) spaced from the weld to be tested (1) to define a closed pressure cavity (4) between the first and second parts;

drilling a hole through the additional weld;

attaching a conduit (8) to the additional weld (6) which communicates with the hole;

supplying a fluid under pressure to establish a predetermined test pressure in the pressure cavity; and

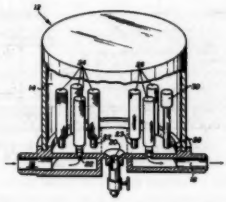
detecting a leakage of the fluid supplied to the pressure cavity using a leak detector connected to the conduit.

4,513,606

SURFACTANT MONITOR FOR AVIATION FUEL FILTER/SEPARATORS

Donald L. Rhynard, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,201
Int. Cl.³ G01N *15/00*
U.S. Cl. 73—61 R **2 Claims**



1. In a filter/separator unit having two stages for separating moisture and filtering particulate matter the improvement comprising:

a replaceable cylindrical element for monitoring cumulative saturation of separating elements used to separate moisture from aviation fuel, constructed of a material readily testable for surfactant contamination, said cylindrical

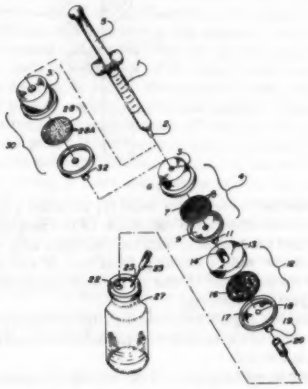
element adapted to be replaced in the unit whenever said separating elements have a moisture content below a predetermined level.

4,513,607

ANALYTICAL FILTRATION TECHNIQUE

John Coupal, 329 Melbourne Way, Lexington, Ky. 40502

Filed Oct. 20, 1981, Ser. No. 313,231
Int. Cl.³ G01N *15/02*
U.S. Cl. 73—61.4 **10 Claims**



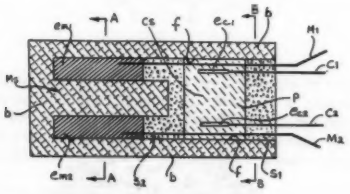
1. A procedure for classifying macroaggregate and colloidal particles in a liquid dispersion by size wherein the dispersion is passed through a first capillary filter of selected pore diameter to retain particles and then through a tortuous path provided by a fibrous filter composed of fibers having affinity for the colloidal substance for removal of a portion of the colloidal particles and the balance of the particles are retained in the liquid passing through the first filter and the fibrous filler.

4,513,608

MOISTURE SENSING AND CONTROL DEVICE

Kenneth J. Cuming, 68 Robinson Rd., Hawthorn, Victoria, Australia

Filed Nov. 9, 1982, Ser. No. 440,474
Claims priority, application Australia, Nov. 10, 1981, PF1504/81
Int. Cl.³ G01R *27/20*; G01N *27/12*
U.S. Cl. 73—73 **14 Claims**



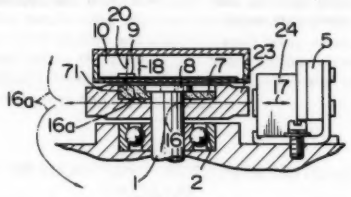
1. A moisture sensing assembly comprising a body having therein a first zone formed of porous material with a first range of pore size having a first mean pore size and a second zone formed of a porous material with a second range of pore size having a second mean pore size such that in use said body is located within a desired soil area under surveillance whereby both said first and second zones are placed in hydraulic conduction with the desired soil area, said first mean pore size being substantially greater than said second mean pore size such that the second zone will remain hydrated when the first zone is becoming dehydrated, and control means associated with each of said first and second zones for sensing an electrical property of each of said zones, said control means including electrode elements associated with each of said first and second zones in spaced relation and defining therebetween a respective electric current flow path through each of said first and second zones, said control means further including a magnetic coupling means for electrically isolating respective pairs of said electrode elements to thereby define electric current flow paths through said respective first and second zones.

4,513,609

ELECTROMAGNETIC ROTATION DETECTING APPARATUS

Akihiko Takenaka, Kariya; Miyao Arakawa, Nagoya; Masahiro Sato, Toyoake, and Toshiyuki Yamaguchi, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 9, 1983, Ser. No. 502,653
Claims priority, application Japan, Jun. 14, 1982, 57-100638
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—116 **4 Claims**



1. An electromagnetic rotation detecting apparatus for an internal combustion engine comprising:

a housing;

a rotary shaft rotatably received in said housing and adapted to be rotatably drive by said engine;

a signal rotor fixedly mounted on said rotary shaft, said rotor including magnetic pole means for producing a magnetic flux in a direction substantially perpendicular to a principal plane surface thereof;

first electromagnetic pickup means, facing said signal rotor in the diametrical direction thereof, for magnetically detecting and generating a first rotation signal from said rotor;

second electromagnetic pickup means, operatively associated with said magnetic pole means of said signal rotor, for magnetically detecting and generating a second rotation signal from said rotor;

case means for containing and holding said second electromagnetic pickup means so that it faces said magnetic pole means, said case means being positioned parallel to said principal plane surface of said signal rotor; and

means for mounting said case means such that the angular position of said case means relative to said housing is adjustable.

4,513,610

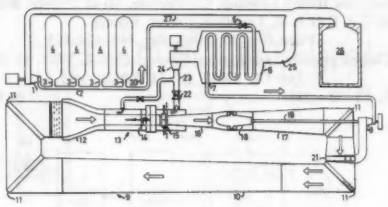
METHOD AND DEVICE FOR ATTAINING A GAS FLOW IN A WIND TUNNEL

Curt Nelander, Spånga, Sweden, assignor to AB Rollab, Sweden

Filed Nov. 10, 1983, Ser. No. 550,448
Claims priority, application Sweden, Sep. 6, 1983, 8304780
Int. Cl.³ G01M *9/00*
U.S. Cl. 73—147 **7 Claims**

1. Method of attaining a gas flow in a wind tunnel, characterized in that a flow medium, preferably air, is caused to flow from a pressure storage (4) via a turbine (8) into the wind

tunnel (9), that the turbine (8) is arranged to drive a fan (18) positioned in the wind tunnel (9), and that a partial flow of the medium flowing in the wind tunnel (9) is deflected from the



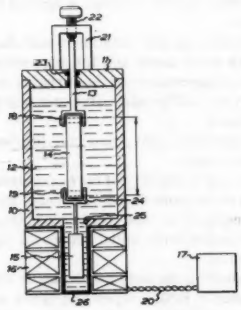
wind-tunnel circuit, whereas the main part is recycled and mixed with the flow being successively fed from the turbine (8).

4,513,611

APPARATUS FOR MEASURING THE SWELLING OR SHRINKAGE OF A SPECIMEN IN A FLUID

Leif R. Bohlin, Krankesjövägen 12, S-240 15 Södra Sandby, Sweden

Filed Aug. 29, 1983, Ser. No. 527,212
Claims priority, application Sweden, Sep. 1, 1982, 8204977
Int. Cl.³ G01N *33/44*
U.S. Cl. 73—150 R **4 Claims**



1. An apparatus for measuring the effects of fluids such as gases and liquids on swelling or shrinkage of a specimen comprising a container for accommodating the specimen and the fluid; means for suspending the specimen in the fluid in the container; a transducer affixed to the specimen at a distance from the point of suspension thereof such that said transducer is maintained within said fluid and exerts minimized tension on the specimen; and a sensor isolated from the fluid, the sensor being connectable to indicating or recording apparatus and adapted to electromagnetically sense the movement of the transducer under the influence of the fluid on the specimen.

4,513,612

MULTIPLE FLOW RATE FORMATION TESTING DEVICE AND METHOD

Walter F. Shalek, Bellaire, Tex., assignor to Halliburton Company, Duncan, Okla.

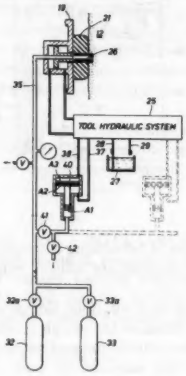
Filed Jun. 27, 1983, Ser. No. 508,304
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—155 **12 Claims**

1. A method for measuring the permeability of earth formations traversing a well bore, comprising:

(a) establishing, through the wall of the well bore and isolated from fluids within the well bore, direct fluid flow communication with an adjacent formation interval,

(b) drawing a first fluid sample from the formation interval to determine a first fluid permeability property for the interval,

(c) drawing a second sufficiently large fluid sample from the formation interval to substantially remove the well bore invasion fluid from the immediate area and flow connate formation fluid instead, and



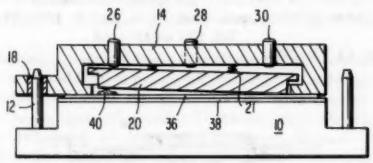
(d) subsequently making at least one flow test from the formation interval to determine the formation flow permeability property which obtains with the actual connate formation fluids from the interval and comparing this permeability property with said first fluid permeability property to determine the extent of possible formation damage due to prior invasion of drilling fluids from the well bore into the formation.

4,513,613

PARTICLE DETECTION SYSTEM

Yves Darves-Bornoz, LaGrangeville; George E. Melvin; Michael G. Ryan, both of Poughkeepsie, and Dennis L. Saylor, LaGrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1983, Ser. No. 502,057
Int. Cl.³ G01N *19/08*
U.S. Cl. 73—159 **13 Claims**



1. A system for detecting the presence of a contaminant that influences the planarity of a sheet comprising:

a stage having a surface for supporting said sheet;

a movable pick-up head having a surface conforming to the surface on said stage, said pick-up head movable into and out of position over said stage to deposit onto and remove said sheet from said stage;

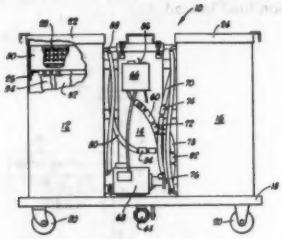
means on said head to sense whether or not said surface on said head is in uniform contacting engagement with said sheet supported by said stage; and

means receiving the output of said sensor means to determine whether or not said contacting engagement is achieved.

4,513,614
METHOD AND DEVICE FOR FILTERING LUBRICATING OIL FOR A DOUGH DIVIDER MACHINE

DL Adcock, 6412 S. Douglas Ave., Oklahoma City, Okla. 73139

Filed May 25, 1983, Ser. No. 498,064
Int. Cl.³ G01N 5/00, 33/10; B01D 37/00
U.S. Cl. 73—169 3 Claims



1. A method of lubricating a dough divider machine of the type which continuously utilizes mineral oil as a lubricant, comprising:

capturing mineral oil, flour, dough and contaminants which become mixed as the dough divider machine operates;

filtering the captured mineral oil, flour, dough and contaminants so that substantially pure mineral oil is separated therefrom;

injecting the separated mineral oil back into the dough divider machine for lubrication;

measuring the weight of bakery products which are produced by the dough divider machine during a predetermined period;

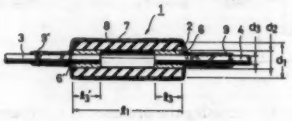
measuring the weight of mineral oil lost as mineral oil is used to lubricate the dough divider machine, is filtered and is returned to lubricate the dough divider machine during said predetermined period; and

determining from the measured weight of the bakery products and the measured weight of lost mineral oil, the amount of mineral oil in the bakery products produced during said predetermined period.

4,513,615
THERMAL AIR FLOW METER

Kanemasa Sato, and Sadayasu Ueno, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,278
Claims priority, application Japan, Dec. 8, 1982, 57-213869
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 5 Claims

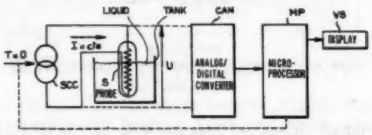


1. In a thermal air flow meter which consists essentially of a hollow cylindrical support made of an insulating material, a heat-sensitive resistor formed on top of said support, and lead wires inserted into the hollow part of said support from either end of said support and bonded to said support by a heat-insulating adhesive, and which measures the flow rate on the basis of changes in resistance due to the temperature of said heat-sensitive resistor, the improvement wherein the ratio of the inner diameter d_2 of said support to the outer diameter d_3 of said lead wires is at least 1.7.

4,513,616
APPARATUS FOR MONITORING THE LEVEL OF LIQUID BY RESISTIVE WIRE

Jean-Jacques Bezard, La Garenne; Charles H. Jourdain, Frepillon, and Bruno Lalanne, Courbevoie, all of France, assignors to J A E G E R, Levallois-Perret, France

Filed Sep. 27, 1982, Ser. No. 424,442
Claims priority, application France, Oct. 8, 1981, 81 18960
Int. Cl.³ G01F 23/24; G01K 7/16
U.S. Cl. 73—295 26 Claims



1. An apparatus for determining a level of a liquid in a tank comprising:

a temperature dependent resistive wire probe at least partially immersed in said liquid in a generally vertical orientation in said tank, said resistive probe sensing variations in the liquid level;

a power supply for applying electrical energy to said resistive wire probe;

means for detecting an electrical parameter in said resistive wire probe;

means for memorizing an initial value of said electrical parameter when electrical energy is applied to said resistive wire probe;

means for monitoring any variation in said electrical parameter from its initial value and for generating a differential parameter representative of the variation in said electrical parameter, said differential parameter being related to the level of liquid;

converting means for converting said differential parameter into digital values;

means for storing a plurality of correspondence tables defining digital corrections of the differential parameter digital values generated by said converting means said tables being associated with initial values of said parameters being detected;

means for selecting the associated one of said plurality of correspondence tables depending upon the memorized initial value of said electrical parameter being detected;

means for determining from said selected correspondence table, a digital correction corresponding to the differential parameter digital value generated by said converting means, and for generating a corrected differential parameter digital value.

4,513,617
STORAGE TANK GAUGING MEASURING APPARATUS

Terry S. Hayes, Wichita, Kans., assignor to Mitch's Self Service Gas, Inc., Great Bend, Kans.

Filed Jan. 3, 1983, Ser. No. 455,289
Int. Cl.³ G01F 23/10
U.S. Cl. 73—313 11 Claims

1. A quantity indicator for a fluid storage system comprising:

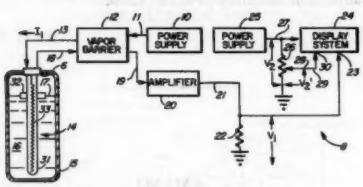
(a) measuring means an electrical power source means connected to measuring means, said measuring means coacting with float operated means mounted in said storage system to produce separate outputs in response to the maximum and minimum quantity of fluid remaining in said system;

(b) means for receiving said generated output responses, and converting said responses at corresponding voltage V_1;

(c) calibration means coupled to said receiving and converting means, for setting the maximum voltage deviation of

said voltage V_1 from said fluid storage system between a maximum and minimum condition;

(d) comparison voltage generation means developing an output voltage V_2;



(e) adjusting means for accepting said voltage V_2 and setting said voltage V_2 to a value V_2 corresponding to the value of V_1 at a maximum fluid quantity indication; and,

(f) display means accepting said voltage V_1 and V_2 and indicating the difference in said voltages, and displaying said difference.

4,513,618

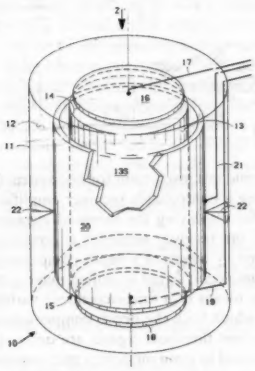
GRAVITY GRADIOMETER AND METHOD

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 2, 1982, Ser. No. 364,740

Int. Cl.³ G01V *7/00*

U.S. Cl. 73—382 G **14 Claims**



1. Apparatus comprising:

a generally cylindrical housing having a vertical axis and containing a fluid;

float means suspended within said fluid and having an axis z oriented with the vertical gravitational field g(z) for responding to the vertical gradient $\partial g_z/\partial z$ of the vertical gravitational field g(z) by producing a force representative of the vertical gradient $\partial g_z/\partial z$ only of the vertical gravitational field, the float means having a weight substantially supported by its buoyancy in the fluid and having a mass distribution of a low mass-high mass dipole along the axis z, the force produced being representative of the vertical gradient $\partial g_z/\partial z$ and tending to a change of position of the float means in the fluid, the float means having an electrically conductive surface and being generally cylindrical in shape having a first end, a second end, and a radial surface and having a vertical axis generally coaxial with the vertical axis of the housing;

sensing and restoring means responsive to a change in position of the float means from a null position for generating and applying to the float means a countervailing force opposing the force representative of the vertical gradient $\partial g_z/\partial z$ of the vertical gravitational field and electrostatically maintaining the float means at the null position, the countervailing force thus being representative of the vertical gradient $\partial g_z/\partial z$ of the vertical gravitational field, the sensing and restoring means comprising a first capacitive element including a first electrically conductive plate adjacent the first end of the float means, a second capacitive element including a second electrically conductive plate adjacent the second end of the float means, a third capacitive element comprising a third electrically conductive plate adjacent the radial surface of the float means, and wherein at least the first capacitive element and the second capacitive element vary in capacitance responsive to the force tending to vertical displacement of the float means; and

signal means for taking off a signal representative of the thus generated countervailing force representative of the vertical gradient $\partial g_z/\partial z$ of the vertical gravitational field.

4,513,619

TESTING THE BALANCE OF A ROTATABLE MEMBER

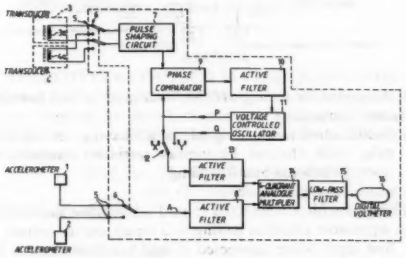
John A. Widdall, Woodford, England, assignor to British Aerospace Public Limited Company, London, England

Filed Jan. 12, 1983, Ser. No. 457,392

Claims priority, application United Kingdom, Jan. 13, 1982, 8200904

Int. Cl.³ G01M *1/22*

U.S. Cl. 73—455 **3 Claims**



1. Apparatus for determining the amount and location of unbalance of an aircraft propellor, the apparatus comprising:

rotation sensor means, positioned near said propellor, for forming a train of pulses each indicative of movement of the propellor through a predetermined point in its rotation;

phase-locked voltage-controlled oscillator means, connected to receive said train of pulses, for forming first and second sinusoidal reference signals which are both locked in phase to said train of pulses and between which there is a phase-difference of substantially ninety degrees, the phase-locked oscillator means comprising regenerative feedback loop means incorporating an active inverting integrator, two reference signal output terminals respectively coupled to the input and output sides of the active inverting integrator, and phase-comparator means, having two inputs respectively connected to receive a portion of the signal formed at one of said signal output terminals and said pulse train, for forming an error signal indicative of phase error between said signal portion and said pulse-train, the output of the phase-comparator means being coupled to said regenerative feedback loop means for injecting said error signal into the regenerative feedback loop means;

accelerometer means, positioned on said aircraft, for generating a vibration signal indicative of radial force produced

as a result of unbalanced mass components of the rotating propellor;

selector switch means connected to said two reference signal output terminals of the oscillator means and operable for enabling one of the two reference signals to be passed to an output of the selector switch means;

multiplying means, connected to said accelerometer means and said selector switch means, for multiplying the vibration signal and the selected reference signal together; and

average value measuring means, connected to the multiplying means, for measuring the average value of its output.

4,513,620

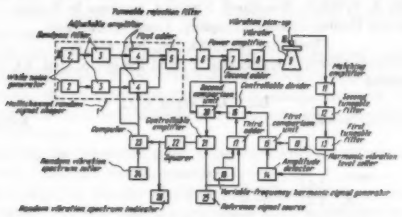
SYSTEM FOR TESTING ARTICLES WITH RANDOM AND HARMONIC VIBRATIONS

Yan S. Uretsky; Rashid R. Kajumov; Zaur A. Bashirov; Alfia G. Bashirova, and Alexandr A. Strelnikov, all of Kazan, U.S.S.R., assignors to Kazansky Aviatsionny Institut Imeni A. N. Tupoleva, U.S.S.R.

Filed Aug. 12, 1983, Ser. No. 522,385

Int. Cl.³ G01M *7/00*

U.S. Cl. 73—664 **4 Claims**



1. A system for testing articles with random and harmonic vibration comprising:

a multichannel random signal shaper having several channels, each channel having an intrinsic amplitude-frequency response and including:

a white noise generator;

a bandpass filter connected to said white noise generator;

an adjustable amplifier having two inputs and an output, the first input being connected to said bandpass filter; a first adder having several inputs whose number corresponds to the number of said channels and an output, said inputs of said adder being connected to the outputs of said adjustable amplifiers of the respective channels;

a tuneable rejection filter having two inputs and an output, the first input being connected to the output of said first adder;

a second adder having two inputs and an output, the first input being connected to said output of said tuneable rejection filter;

a power amplifier connected to the output of said second adder;

a vibrator connected to the output of said power amplifier;

a vibration pick-up mounted on the vibrator;

a matching amplifier connected to said vibration pick-up;

a second tuneable filter having a reverse amplitude-frequency response with respect to an amplitude-frequency response of said tuneable rejection filter and provided with two inputs and an output, the first input being connected to said matching amplifier;

a first tuneable filter having two inputs and a harmonic signal output and a suppression output, the first input being connected to said output of said second tuneable filter;

a variable-frequency harmonic signal generator having a signal output and a control output, said control output being connected to said second input of said rejection filter, to said second input of the first tuneable filter and to said second input of the second tuneable filter to enable synchronous tuning thereof;

a random vibration spectrum analyzer connected to said suppression output of the first tuneable filter, the output of said analyzer being connected to the second input of said adjustable amplifier in each channel.

4,513,621

ULTRASONIC TEST INSTRUMENT WITH CONTROLLABLE AMPLIFIER

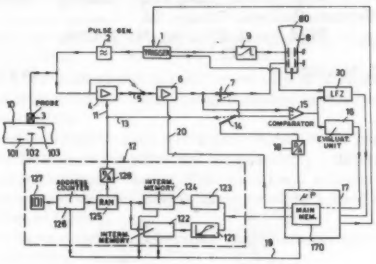
Peter Renzel, Düren, and Klaus Kroesen, Bonn, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Feb. 1, 1984, Ser. No. 575,878

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307224

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—631 **1 Claim**



1. An ultrasonic test instrument for nondestructive testing of materials having a controllable receiver amplifier and a cathode ray tube for displaying the received ultrasonic echo signals, in which the receiver amplifier is controlled in dependence upon time by means of a depth compensation signal, or else the ultrasonic echo signal amplified independently of time is evaluated by means of a time-dependent variable threshold signal, and in which both the depth compensation signals and the time-dependent threshold signals are derived from digital signal values stored in main memories and converted to corresponding analog values by means of a digital-to-analog converter, the improvement comprising:

a single main memory;

a first and a second intermediate memory coupled in series with said main memory, said first intermediate memory containing signal values corrected with respect to the signal values stored in said main memory taking into account the control voltage characteristic of the receiver amplifier, and said second intermediate memory containing inverse voltage signal values with respect to the signal values stored in the main memory;

a read-write memory coupled with its input to said first and said second intermediate memory;

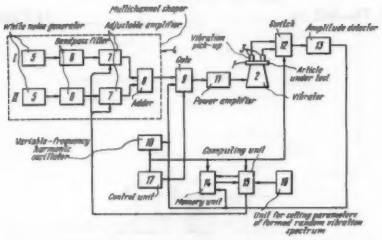
the output of said read-write memory connected via said digital-to-analog converter to the controllable receiver amplifier and for displaying the threshold signal connected also via switches to said cathode ray tube, and

said controllable receiver amplifier coupled in series with a calibratable amplifier calibrated in decibels for determining the digital signal values stored in said main memory.

4,513,622
METHOD OF FORMING RANDOM VIBRATION SPECTRUM AND DEVICE THEREFOR

Yan S. Uretsky, Kazan, U.S.S.R., assignor to Kazansky Aviatsionny Institut Imeni A. N. Tupoleva, U.S.S.R.

Filed Aug. 22, 1983, Ser. No. 525,310
Int. Cl.³ G01M 7/00
U.S. Cl. 73—664 3 Claims



2. A device for forming a random vibration spectrum at check points on an article under test comprising:

a multichannel random signal shaper having several channels, each channel thereof including:

a white noise generator;

a bandpass filter connected to said white noise generator;

an adjustable amplifier having two inputs and an output, the first input being connected to said bandpass filter;

an adder having several inputs whose number corresponds to the number of said channels and an output, said inputs of said adder being connected to the outputs of said adjustable amplifiers of the respective channels;

a gate having three inputs and an output, the first input being connected to the output of said adder;

a power amplifier connected to the output of said gate;

a vibrator mounting said article under test and connected to the output of said power amplifier;

vibration pick-ups mounted on said article under test at said check points;

a switch having several inputs whose number corresponds to the number of said vibration pick-ups connected to the respective vibration pick-ups, a control input, and an output;

an amplitude detector connected to said output of said switch;

a unit for setting parameters of spectral vibration acceleration density in each band of the predetermined frequency range at each check point on said article under test;

a computing unit having three inputs and two outputs, the first input being connected to said setting unit, while the first output is connected to the second input of said adjustable amplifier in each channel;

a memory unit having three inputs and an output connected to the second input of said computing unit, the first input being connected to the second output of said computing unit, while the second input is connected to the output of said amplitude detector;

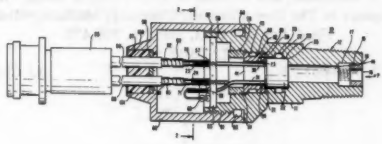
a control unit having two outputs, the first output being connected to said control input of said switch, to the third input of said memory unit and to the third input of said computing unit, while the second output is connected to the third input of said gate;

a variable-frequency harmonic oscillator having its input connected to the first output of said control unit and the output thereof connected to the third input of said gate and to the second input of said memory unit.

4,513,623
TRANSDUCER HOUSING EMPLOYING CRIMPED LEADS

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Jr., Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Sep. 9, 1983, Ser. No. 530,525
Int. Cl.³ G01L 9/06
U.S. Cl. 73—721 20 Claims



1. A transducer housing apparatus, comprising,

a first housing section, said housing section having an internal bore extending from a first end to a second end with said bore having an opening at said first end and coaxial with a larger diameter transducer containing recess,

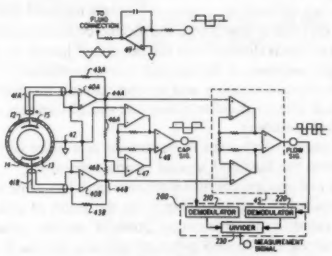
a transducer header located within said larger diameter recess and having a top surface facing said first end and in communication with said opening and having a bore with leads emanating from said bore, locking means coupling said header within said housing section,

a second hollow housing section coupled to said first section and having tubular contact members depending therefrom into which members said leads are inserted to be crimped within said tubular contact members.

4,513,624
CAPACITIVELY-COUPLED MAGNETIC FLOWMETER

Edward J. McHale, Medfield, Mass.; Yousif A. Hussain, Horley, England; Michael L. Sanderson, Stockport, England, and John Hemp, Cranfield, England, assignors to The Foxboro Company, Foxboro, Mass.

Filed Jan. 20, 1983, Ser. No. 459,567
Int. Cl.³ G01F 1/58
U.S. Cl. 73—861.12 19 Claims



1. A magnetic flowmeter for measuring the flow rate of a flowing fluid comprising:

a flow conduit having a dielectric portion through which a fluid whose rate of flow is to be determined is adapted to flow;

means for generating within said dielectric portion a time varying magnetic field transverse to the direction of flow;

electrode means capacitively coupled to the interior of said flow conduit through said dielectric portion for detecting an electrical signal induced by the intersection of the flowing fluid and said magnetic fields which is a function of flow rate; and

low-input-impedance means having an input impedance which is less than a prescribed percentage of the capacitive impedance presented by the capacitive coupling between said electrode means and the fluid,

and said low-input-impedance means being coupled to said electrode means for producing a current signal proportional to said induced electrical signal, whereby said current signal is indicative of the flow rate of said fluid.

4,513,625

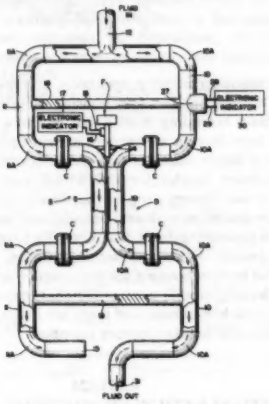
FLOW METER AND DENSITOMETER APPARATUS AND METHOD OF OPERATION

Keith S. Campman, and William B. Ernst, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1983, Ser. No. 509,478

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.72 **13 Claims**



1. A mass flow meter apparatus, for measuring the flow rate of a fluid stream, the apparatus comprising:

a dynamic leg defined by a first conduit member having an inlet end and an outlet end, the first conduit member has several bends therein, and the bends are joined by several straight sections of the first conduit member;

a static leg defined by a second conduit member having an inlet end and a closed end, the second conduit member has several bends therein, and the bends are joined by several straight sections of the second conduit member;

the first conduit member and second conduit member are in contact with each other along one straight section of each conduit member;

a force measuring means is positioned at a point of contact between the first and second conduit members;

the first and second conduit members each have one straight section positioned upstream from the point of contact of said conduit members, one straight section positioned downstream from said point of contact, and each of said straight sections have a flexible connection therein; and wherein

the first conduit member is adapted for carrying the first part of a fluid stream from the inlet end, through the conduit member, and discharging the stream through the outlet end;

the second conduit member is adapted for carrying the second part of said fluid stream from the inlet end into the conduit member, where the fluid is retained, whereby said retained fluid exerts a fluid pressure equal to the fluid pressure of the first part of the fluid stream; and

the first part of the fluid stream exerts a force, caused by its flowing motion through the first conduit member, which force is sensed and recorded by the force measuring means, and the flow rate of said first part of the fluid stream is then derived as a function of said force.

4,513,626

TORQUE DETECTOR

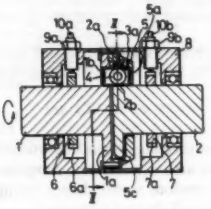
Hideki Obayashi, Okazaki; Tokio Kohama, Nishio; Kimitaka Saito, Okazaki; Hisasi Kawai, Toyohashi, and Toshikazu Ina, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 22, 1983, Ser. No. 468,715

Claims priority, application Japan, Feb. 22, 1982, 57-27921; Mar. 26, 1982, 57-49324; Apr. 22, 1982, 57-67547; May 8, 1982, 57-77232

Int. Cl.³ G01L *3/14*

U.S. Cl. 73—862.34 **11 Claims**



1. A torque detector comprising:

(1) a first shaft adapted for integral connection with a driving shaft of an internal combustion engine so as to be rotated therewith;

(2) a second shaft adapted for connection to a load, which is arranged so as to be coaxially opposed to said first shaft, opposing ends of each of said shafts being provided with a flange so as to be opposed to each other, said flange of one of said shafts being provided with a plurality of long holes, each of which penetrates said flange and extends in the direction of rotation of said shafts along the periphery of said flange;

(3) a plurality of elastic members, said elastic members being accomodated within said long holes;

(4) elastic member receiving means for receiving both ends of each of said elastic members which are supported by the walls defining both ends of each of said long holes and projecting on both sides of said flange of said one shaft;

(5) a covering member which is integrally formed with said flange of the other one of said shafts so as to cover the peripheral portion of said flange of said one shaft, said covering member being provided with a wall portion which is opposed to said flange of said other shaft through said flange of said one shaft, a plurality of long grooves being formed in said flange of said other shaft and in said wall portion of said covering member so as to be opposed to each other through said long holes formed in said flange of said one shaft, both projecting ends of each of said receiving means projecting into said opposed long grooves formed in said flange of said other shaft and said covering member;

(6) angular phase difference detecting means for detecting the angular phase difference between said first and second shafts during the rotation thereof;

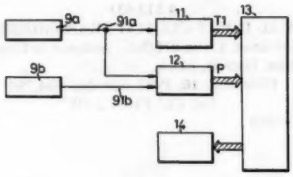
(7) data processing means for calculating torque from the angular phase difference; and

(8) display means for indicating the calculated torque.

4,513,627
TORQUE DETECTOR

Tokio Kohama, Nishio; Hideki Obayashi; Kimitaka Saito, both of Okazaki; Toshikazu Ina, Nukata, and Seiichi Narita, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 6, 1983, Ser. No. 501,761
Claims priority, application Japan, Jun. 8, 1982, 57-96875
Int. Cl.[3] G01L 3/14
U.S. Cl. 73—862.34 4 Claims



1. A torque detector comprising:

(1) a first rotating member integrally connected to a driving shaft of an internal combusion engine so as to be rotated therewith;

(2) a second rotating member integrally connected to a load, which is provided so as to be coaxially opposed to said first rotating member;

each of said first and second rotating members being provided with a plurality of teeth or notches in the outer periphery thereof so as to be positioned in each combustion stroke of each piston of the engine, each of said plurality of teeth or notches formed in said first rotating member being opposed to each of said plurality of teeth or notches formed in said second rotating member;

(3) an elastic member for connecting the opposed ends of said first rotating member and said second rotating member;

(4) detecting means for detecting the passing of said teeth or notches of said first and second rotating member and generating pulse signals at the time when said detecting means detects the passing of said teeth or notches, which is provided so as to be opposed to the outer periphery of each of said first and second rotating members;

(5) a pulse phase difference detecting means for detecting pulse phase difference between said pulse signals;

(6) a rotating speed counting means for counting rotating speed of said engine;

(7) an angular phase difference detecting means for detecting angular phase difference between said first rotating member and said second rotating member from the pulse phase difference detected by said pulse phase difference detecting means, and the rotating speed counted by said rotating speed counting means; and

(8) a data processing means for calculating torque from the angular phase difference, for adding calculated torque in each combustion stroke of each piston and for averaging the added torque.

4,513,628
TORQUE DETECTOR

Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Toshikazu Ina, Nukata, and Seiichi Narita, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Inc., Kariya, both of, Japan

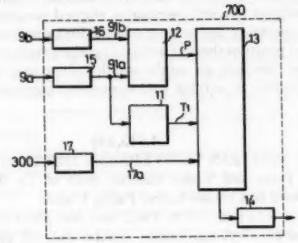
Filed Jun. 6, 1983, Ser. No. 501,762
Claims priority, application Japan, Jun. 8, 1982, 57-99033
Int. Cl.[3] G01L 3/14
U.S. Cl. 73—862.34 6 Claims

1. A torque detector comprising:

(1) a first rotating member adapted for connection to a driving shaft of an internal combustion engine so as to be rotated therewith;

(2) a second rotating member adapted for connection to a load, which is provided so as to be coaxially opposed to said first rotating member;

(3) at least one elastic member for connecting said first rotating member to said second rotating member; said at least one elastic member deforming in response to torque applied to said first rotating member and producing an angular phase difference between said rotating members due to the deformation thereof;



(4) an angular phase difference detecting means for detecting angular phase difference between said first rotating member and said second rotating member;

(5) a no load condition detecting means for detecting a no load condition of said engine; and

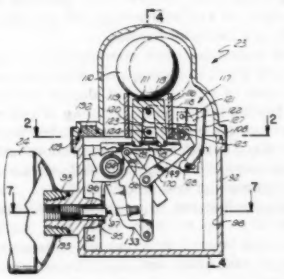
(6) a data processing means for calculating accurate torque from the angular phase difference between said first rotating member and said second rotating member under a load condition and under the no load condition,

said no load condition detecting means supplying a no load condition signal to said data processing means when said engine is under the no load condition.

4,513,629
SHOCK RESPONSIVE DEVICE

William F. Keller, West Covina, and Richard D. Sibley, Anaheim, both of Calif., assignors to Koso International, Inc., Sante Fe Springs, Calif.

Filed Sep. 20, 1982, Ser. No. 420,050
Int. Cl.[3] G05G 17/00; F16K 17/36
U.S. Cl. 74—2 10 Claims



1. A seismic actuator comprising:

a first arm mounted for swinging movement about an axis between first and second positions;

means yieldingly urging said first arm about said axis and toward said second position thereof;

a latch element engageable with said first arm at a location offset from said axis in a relation releasably retaining said first arm in said first position;

shock responsive means operable in response to shock forces to actuate said latch element in a direction automatically releasing said first arm for movement by said yielding means to said second position;

a second arm operable by swinging movement to actuate a controlled element;

first and second links connected pivotally together at first ends thereof and connected pivotally at second ends to a support structure and to said second arm respectively; and

a third link extending between said first arm and at least one of said first and second links and operable to swing said first and second links from relatively angularly disposed positions toward essentially aligned positions in response to swinging movement of said first arm toward said second position thereof and in a relation swinging said second arm through an angle smaller than said first arm in a direction to actuate said controlled element.

4,513,630

MOTION CONVERSION MECHANISM

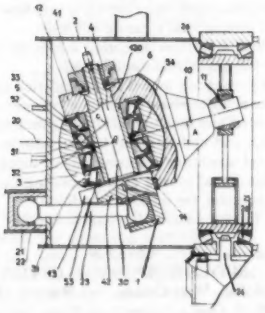
Gérard Pere, and Roger Badaut, both of Le Breuil, France, assignors to Creusot-Loire, Paris, France

Filed Jul. 6, 1982, Ser. No. 395,378

Claims priority, application France, Jul. 30, 1981, 81 14898

Int. Cl.³ F16H *23/00;* **H03K** *19/20;* **F01B** *3/00, 13/04*

U.S. Cl. 74—60 **5 Claims**



1. Mechanism for converting a rotary motion into a rectilinear to-and-fro motion, comprising

(a) an oscillating plate articulated about a pivoting axle on a supporting cross-piece pivotally mounted on a fixed housing about an axis intersecting said pivoting axle at a right angle at a center of oscillation;

(b) said oscillating plate comprising two spaced portions forming a yoke capping said cross-piece and supporting two ends of a coupling rod aligned with said pivot axle and passing into a central housing of said cross-piece;

(c) said central housing being bounded by an inner wall shaped as a cylinder of revolution about said pivoting axle;

(d) outer conical bearing cages fastened on said inner wall and centered on said pivoting axle

(e) said coupling rod being subjected to axial prestressing force taken up by inner cages of a bearing which are supported in axial direction and outwardly on two portions of said yoke, and inwardly on an annular spacer disposed between said yoke portions;

(f) an even number of substantially identical conical bearings stacked over the entire height of said housing;

(g) load center of said bearings being spaced symmetrically on either side of said center of oscillation;

(h) said inner cages being fitted onto a cylindrical bush itself fitted without play onto said coupling rod and extending over the entire space comprised between said two yoke portions;

(i) said inner cages being distributed over the entire length of said bush while leaving between them gaps in which are inserted spacer rings whose thickness is adjusted so that said pre-stressing force is distributed by said bearings and causes at least complete take-up of the play by radial elastic deformation of said cages;

(j) the length of said bush being equal to the total thickness of said inner cages and said spacer rings, reduced by compression enabling said play to be taken up;

(k) said inner cages being applied to said bush, and said outer cages being applied to said cylindrical wall.

4,513,631

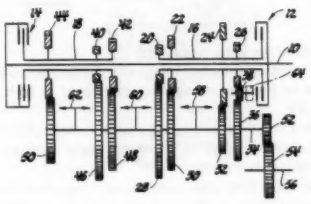
DUAL INPUT CLUTCH TRANSMISSION

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 16, 1983, Ser. No. 504,794

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—360 **5 Claims**



1. A dual input clutch type transmission comprising: a drive shaft; a pair of input shafts; a pair of input clutches selectively operable to connect said drive shaft with respective ones of said input shafts; first, second and third ratio gears drivingly connected to one of said input shafts; first, second and fourth ratio gears drivingly connected to the other of said input shafts; output shaft means; a plurality of driven gear means rotatably supported on said output shaft means and meshing with said first, second and third ratio gears on said one input shaft and with said first, second and fourth ratio gears on said other input shaft; and a plurality of mechanical clutch means for selectively drivingly connecting said driven gear means with said output shaft means and for cooperating with said input clutches to selectively provide first, second, third and fourth ratios between said drive shaft and said output shaft means, whereby a shift from fourth ratio to second ratio can be accomplished by engaging the appropriate mechanical clutch means to establish second ratio between the one input shaft and the output shaft means while fourth ratio is established through the other input shaft and then interchanging said input clutches so that fourth ratio is disengaged from the drive shaft while second ratio is engaged with the drive shaft.

4,513,632

MOUNTING BRACKET FOR A STEERING COLUMN CONTROL STALK

Jack E. Swoveland, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Jan. 16, 1984, Ser. No. 570,766

Int. Cl.³ H01H *9/00;* **B25G** *3/28;* **A47H** *1/14*

U.S. Cl. 74—484 R **4 Claims**

1. An improved mounting bracket for a vehicle steering column mounted control stalk, the steering column including an outwardly-extending boss having a key formed thereon, comprising:

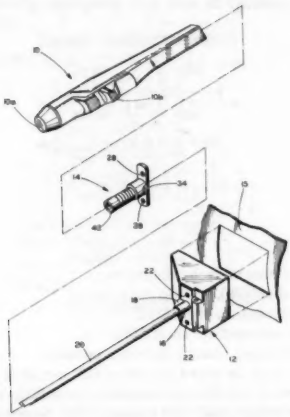
a generally flat base portion defining an aperture having a first inner diameter and adapted to receive said steering column boss;

an intermediate portion extending from a flat surface of said base portion, said intermediate portion defining a first passageway having a second inner diameter at least equal

to said first inner diameter of said aperture of said base portion;

a first slot formed in said base and intermediate portions adapted to receive said steering column key and extending axially co-extensively with said aperture and said first passageway;

a second slot formed in said base and said intermediate portions opposite said first slot, said second slot being smaller in size than said first slot;



an end portion extending from an end of said intermediate portion opposite said base portion, said end portion defining a second passageway having an inner diameter smaller than said second inner diameter of said intermediate portion, said end portion further including means for releasably engaging said steering column mounted control stalk; and

means for securing said base portion to said steering column.

4,513,633

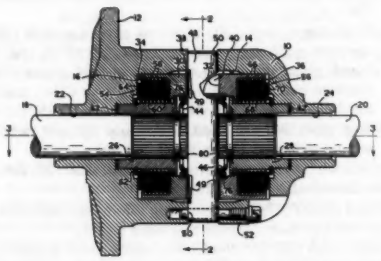
POSITIVE DRIVE AND GENERATED CAM SURFACES THEREFOR

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 8, 1982, Ser. No. 366,611

Int. Cl.³ F16H *35/04, 1/44;* **F16B** *13/42*

U.S. Cl. 74—650 **21 Claims**



1. In a positive drive of the type including an input member adapted to be rotated by input driving torque transmitted from a power source, first and second output members, defining an axis of rotation of the drive, first and second clutch means operably associated with said first and second output members, respectively, each of said clutch means having a disengaged mode which allows its respective output member to rotate relative to said input member when said respective output member is rotating at an angular velocity in the direction of torque transmittal that is greater than one predetermined angular velocity of the other output member, and an engaged mode which maintains a predetermined rotational relationship between said respective output member and said input member when said respective output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than another predetermined angular velocity of the other output member, first and second cam means operably associated with said first and second clutch means, respectively, to move said clutch means from said disengaged mode to said engaged mode, and shaft means, defining an axis, disposed between said first and second clutch means and mounted for rotation with said input member, operative movement of one of said cam means, to move the respective clutch means, occurring in response to pivotal movement of said shaft means through a range relative to said one cam means, the improvement comprising:

(a) said first and second cam means each including a circumferentially-extending ramp cam surface;

(b) said shaft means defining at least a pair of shaft cam surfaces, each of said shaft cam surfaces being disposed to engage one of said ramp cam surfaces of said first and second cam means; and

(c) each engaging pair of said ramp cam and shaft cam surfaces being defined by a common locus of generating lines, a major portion of said generating lines being oriented nonparallel with respect to the axis of said shaft means, to maintain substantial surface-to-surface contact between said shaft means and said one cam means over the range of said pivotal movement of said shaft means.

4,513,634

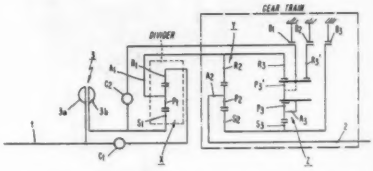
CHANGE-SPEED TRANSMISSION WITH SELECTIVE BYPASS OF HYDROKINETIC UNIT

Kunio Ohtsuka, Ebina, Japan, assignor to Nissan Motor Company, Limited, Japan

Division of Ser. No. 274,292, Jun. 16, 1981, Pat. No. 4,369,672, which is a continuation of Ser. No. 899,991, Apr. 25, 1978, abandoned. This application Aug. 19, 1982, Ser. No. 409,768

Int. Cl.³ F16H *47/08*

U.S. Cl. 74—688 **11 Claims**



1. A change-speed transmission comprising:

an input member (**1**) to receive the input torque;

an output member (**2**) to provide the output torque;

a hydrokinetic unit (**3**) having a pump (**3***a*) connected to said input member for simultaneous rotation therewith and a turbine (**3***b*);

a first and a second clutch (C_1C_2);

a divider in the form of a planetary gear set having at least a first, a second and a third rotary element;

a planetary gear train having a first planetary gear set and a second planetary gear set, each of said first and second planetary gear sets having at least a first, a second and a third rotary element, two of said first, second and third rotary elements of said first planetary gear set being constantly connected to two of said first, second and third rotary elements of said second planetary gear set, respectively, for simultaneous rotation therewith;

said first rotary element of said divider being connected to

one of said first rotary elements of said gear train for simultaneous rotation therewith;

said second rotary element of said divider being connectable through said second clutch (C_2) to one of said second rotary elements of said gear train for simultaneous rotation therewith when said second clutch is engaged;

said output member (2) being connected to a third rotary element of said planetary gear train for simultaneous rotation therewith;

said turbine (3b) being connected to one of said second and third rotary elements of said divider for simultaneous rotation therewith;

said input member being directly connectable through said first clutch (C_1) to the other one of said second and third rotary elements of said divider for simultaneous rotation therewith so as to bypass said hydrokinetic unit when said first clutch is engaged;

whereby the input torque of the input member may be split providing at least a portion of the output torque to the output member bypassing said hydrokinetic unit for increased efficiency.

4,513,635

DIFFERENTIAL GEAR FOR AUTOMOTIVE VEHICLES

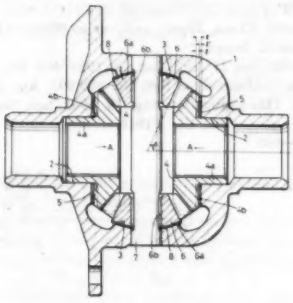
Keisuke Takimura, and Hideo Hamano, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 22, 1983, Ser. No. 477,855

Claims priority, application Japan, Apr. 22, 1982, 57-60225[U]

Int. Cl.³ F16H *1/40, 1/38, 55/18, 57/00*

U.S. Cl. 74—713 **3 Claims**



1. In a differential gear for automotive vehicles including a differential casing, a pair of side gears oppositely situated in and rotatably supported by the differential casing, said side gears having a pitch cone angle α, a pinion shaft arranged at right angle to the axis of the side gears and fixed to the differential casing at both ends thereof, a plurality of pinions rotatably mounted on the pinion shaft and adapted to mesh with the side gears and a spring washer interposed between the back of each side gear and the inner surface of the differential casing, whereby the gear teeth of the side gears and the pinions are adapted to mesh with each other at a predetermined pressure by the resilient force of the spring washer; the improvement comprising a washer interposed between the backs of said pinions and the inner surface of said differential casing and fitted to said pinion shaft, said washer having at most a thickness of l tan α wherein l represents a displacement from an uncompressed condition of said spring washer to a compressed condition thereof exhibiting a predetermined pressure against said side gears.

4,513,636

GEARING TRANSMISSION

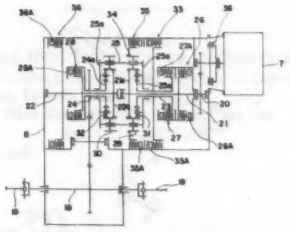
Denzaburo Harada, Katano, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Dec. 20, 1982, Ser. No. 451,369

Claims priority, application Japan, Feb. 1, 1982, 57-13383[U]

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—761 **1 Claim**



1. A gear transmission comprising

an input shaft (20),

a first intermediate shaft (21),

a second intermediate shaft (22),

said shafts being coaxial with one another,

a tubular shaft for rearward travel (23) mounted for relative rotation on said first intermediate shaft (21),

a tubular output shaft (24) mounted for relative rotation on said second intermediate shaft (22),

a planetary gear mechanism comprising a spider (25) mounted at opposite ends on said two tubular shafts (23, 24) and rotatable relative thereto, a ring gear (34), a first planetary subunit, and a second planetary subunit,

said first planetary subunit including

a first sun gear (21*a*) secured to said first intermediate shaft (21),

a second sun gear (23*a*) secured to said tubular shaft for rearward travel (23),

a first planet gear (29) attached to said spider (25) to be in constant mesh with said first sun gear (21*a*), and

a second planet gear (31) attached to said spider (25) to be in constant mesh with said second sun gear (23*a*) and said first planet gear (29),

said second planetary subunit including

a third sun gear (22*a*) secured to said second intermediate shaft (22),

a fourth sun gear (24*a*) secured to said tubular output shaft (24),

a third planet gear (30) attached to said spider (25) in constant mesh with said third sun gear (22*a*), and

a fourth planet gear (32) attached to said spider (25) in constant mesh with said fourth sun gear (24*a*) and said third planet gear (30), wherein said spider (25) and said ring gear (34) are used commonly by said first and second planetary subunits,

a first clutch (26) for connecting said input shaft (20) and said first intermediate shaft (21),

a second clutch (27) for connecting said input shaft (20) and said tubular shaft (23) for rearward travel,

a third clutch (28) for connecting said second intermeidate shaft (22) and said tubular output shaft (24),

a first brake (33) which acts on said tubular shaft (23) for rearward travel,

a second brake (35) which acts on said sing gear (34) and

a third brake (36) which acts on said second intermediate shaft (22), whereby forward speeds are obtained by engaging said first clutch and selectively combining other said clutches and said brakes, and backward speeds are obtained by disengaging said first clutch, engaging said

second clutch and selectively combining said third clutch and said brakes.

4,513,637

GEARING ASSEMBLY

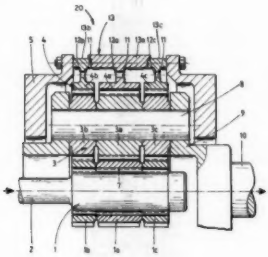
Manfred Hirt, Augsburg, Fed. Rep. of Germany, assignor to Zahnraderfabrik Renk A.G., Augsburg, Fed. Rep. of Germany

Filed May 27, 1982, Ser. No. 382,772

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3221662

Int. Cl.³ F16H *1/28, 57/00*

U.S. Cl. 74—801 **11 Claims**



1. A gearing assembly comprising a plurality of composite gears in interengagement, each composite gear including three gear parts and means coupling the gear parts about an axis for unitary rotation, the coupling means of one of the composite gears including means nonrotationally fixing each gear part to an axial shaft, means independently rotatably mounting each gear part of the other composite gear to an axial shaft, the coupling means of the other composite gear comprising the toothed interengagement of the composite gears, the gear parts being arranged symmetrically along the axis of each composite gear, each part of each composite gear having a diameter, the diameter of each part of each composite gear being the same, each part of each composite gear having a number of gear teeth, the number and shape of all the gear teeth of each part of each composite gear being the same, a central gear part of each composite gear being twice the width of adjacent gear parts, each gear part of each composite gear being rotated relative to each adjoining gear part a distance less than a circular pitch length.

4,513,638

CONTROL MECHANISM FOR SELECTIVE CREEP OF AN AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo; Torao Hattori; Takashi Aoki, both of Wako, and Hiroshi Yoshizawa, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

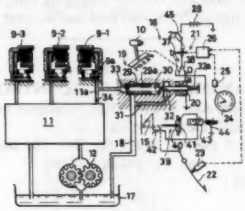
Filed Mar. 31, 1982, Ser. No. 364,027

Claims priority, application Japan, Apr. 4, 1981, 56-50818

Int. Cl.³ B60K *41/18, 41/16*

U.S. Cl. 74—866 **6 Claims**

1. A control mechanism for a transmission of a vehicle having an internal combustion engine, the transmission including a torque convertor, a coupling member, a gear-train, and an operation lever having a neutral position and at least three other positions, the torque convertor, the gear-train, and the coupling member being interposed in a system line for transmitting output torque of the engine to a driving wheel of the vehicle, the operation lever being arranged to operate the coupling member to connect the torque convertor to the gear-train by being moved from the neutral position to one of the other positions; the control mechanism including coupling-preventing means operatively associated with the coupling member for preventing coupling when a throttle valve of the engine is in an idling position and the operation lever is moved from the neutral position to one of the other positions, and change-over means associated with the coupling-preventing means for selectively changing-over the coupling-preventing means from



an operative state preventing coupling to a rest state permitting coupling whereupon the coupling member connects the torque convertor to the gear-train even though the throttle valve is in an idling position.

4,513,639

CREEPING PREVENTING APPARATUS IN AUTOMATIC TRANSMISSION FOR VEHICLE

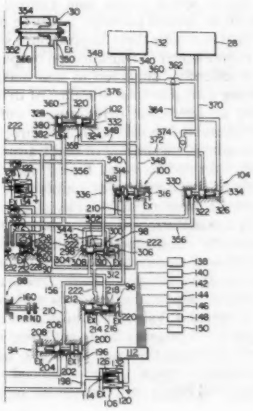
Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 20, 1982, Ser. No. 451,385

Claims priority, application Japan, Dec. 23, 1981, 56-208540

Int. Cl.³ B60K *41/18, 41/16, 41/12*

U.S. Cl. 74—866 **3 Claims**



1. In an automatic transmission for a vehicle comprising a plurality of friction engaging units hydraulically selectively actuated to establish a plurality of speed stages, said plural friction engaging units including at least a first friction engaging unit engaged for attaining a low forward speed stage of a relatively large gear ratio and a second friction engaging unit engaged together with said first friction engaging unit for attaining a high forward speed stage of a relatively small gear ratio, said second friction engaging unit only being released for carrying out a shift from said high forward speed stage to said low forward speed stage, an apparatus for preventing creeping of the vehicle comprising first sensor means for sensing whether or not the accelerator pedal is released or whether or not the throttle valve is full closed, second sensor means for sensing whether or not the vehicle is in its halted state, shift control means for engaging said first and second friction engaging units in response to the two output signals from said

first and second sensor means thereby attaining said high forward speed stage, and fluid pressure control means for reducing the pressure of hydraulic fluid supplied to said second friction engaging unit to a level lower than that of hydraulic fluid supplied to said first friction engaging unit, in response to the two output signals from said first and second sensor means.

4,513,640

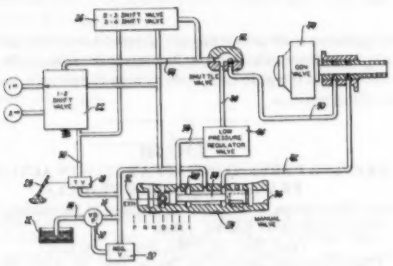
TRANSMISSION SHIFT CONTROL

Paul D. Stevenson, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1983, Ser. No. 503,063

Int. Cl.³ B60K *41/16*

U.S. Cl. 74—870 **2 Claims**



1. A transmission control for a throttle controlled engine driven multispeed transmission having a low speed ratio and a plurality of higher speed ratios, said control comprising; a source of maximum system pressure; a source of throttle pressure proportional to engine throttle position; a source of governor pressure proportional to transmission output speed; a manual valve hydraulically connected to said maximum pressure source and being movable to a plurality of drive ratio conditions including an automatic drive range; shift valve means hydraulically connected to said source of throttle pressure for controlling the automatic shifting of said transmission between the low speed ratio and the next higher speed ratio; a fixed pressure regulator valve means for supplying a fixed pressure signal less than the pressure supplied by said source of governor pressure at a predetermined transmission output speed and being hydraulically connected to said source of maximum pressure through said manual valve when said manual valve is in said automatic drive range; and valve means for communicating the higher of said fixed pressure or said source of governor pressure to said shift valve means for controlling the shifting thereof, said fixed pressure being sufficient to prevent said shift valve from selecting the low speed ratio when the source of throttle pressure is below a predetermined value whereby the transmission will begin operation in the next higher speed ratio.

4,513,641

CLIMBING AID RETRIEVER

Joseph Murray, and Jesse Guthrie, both of 2791 Knollsville Land, Vienna, Va. 22180

Filed May 27, 1983, Ser. No. 498,510

Int. Cl.³ B25B *31/00*

U.S. Cl. 81—486 **11 Claims**

1. A climbing aid retriever comprising

(a) a fork body with longitudinally extended tines;

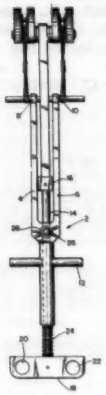
(b) hooks on the ends of said extended tines adapted to engage an operating bar of a climbing aid;

(c) means located on said fork body adapted for engagement by fingers of one hand of a climber;

(d) a longitudinal bore in said fork body extending from the base of the tines to the upper end of the fork body, said bore having a given length;

(e) a rod having first and second ends and having a length greater than said given length and mounted for reciprocation in said bore;

(f) a stop secured to said first end, guided in reciprocation by said longitudinally extending tines and adapted to apply pressure upon a support bar of a climbing aid;



(g) a threaded hole in said fork body extending into said bore and an adjustment screw engaged in said threaded hole for operation by said one hand of a climber for fixing said reciprocated stop while said pressure is applied upon said support bar; and

(h) a handle secured to said second end and adapted to engage the base of a thumb of a climber.

4,513,642

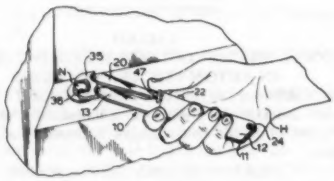
AUTOMATIC RETURN VARIABLE ADJUSTABLE WRENCH

John F. Castner, Sr., P.O. Box 7156, San Diego, Calif. 92107, and Martin I. Sheps, 16139 Ladera Piedra Way, Poway, Calif. 92064

Filed Apr. 28, 1983, Ser. No. 489,542

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—52 **27 Claims**



1. A wrench tool comprising:

a handle member,

an arm member slidingly engageable between an extended position and a retracted position with said handle member,

a wrench head releasably and pivotally attached to said handle member and said arm,

a locking device securing said arm and handle together to hold the head in a fixed selected position on the arm and handle during a rotation of the wrench handle in one direction while allowing limited shifting of the arm relative to the handle when the handle is rotated in the opposite direction, and

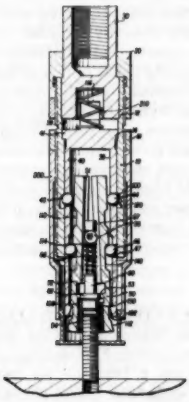
means for releasing said locking device and biasing means for returning said arm to an initial position when said locking means is released.

4,513,643

AUTOMATIC STUD DRIVING TOOL

John A. McKean, Fairview, Pa., assignor to Titan Tool Company, Fairview, Pa.

Continuation-in-part of Ser. No. 360,821, Mar. 24, 1982, Pat. No. 4,470,329, which is a continuation-in-part of Ser. No. 265,706, May 21, 1981, abandoned, and a continuation-in-part of Ser. No. 579,288, Feb. 14, 1984, , which is a continuation of Ser. No. 405,365, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 179,444, Aug. 19, 1980, abandoned. This application Feb. 14, 1983, Ser. No. 466,069
Int. Cl.[3] B25B *19/00*
U.S. Cl. 81—53.2 17 Claims



1. An automatic stud driving tool comprising:

a hollow body,

a carriage disposed within said body and having a longitudinal axis, the carriage provided with a cavity extending therethrough along said axis;

a pair of opposed jaws provided partially within said cavity and capable of sliding simultaneously as a unit along the axis of said carriage, the jaws being substantially non-rotatable with respect to said carriage, means for assuring that the jaws are capable of moving with respect to said carriage to at least two positions relative to each other, an open and a closed position;

the pair of jaws being provided with gripping means for gripping a stud in a non-rotatable manner when said jaws are in said closed position, and for releasing said stud when said jaws are in said open position;

preventing means for positively preventing the jaws from moving from the open position to the closed position unless a stud is engaged with said gripping means;

holding means provided to prevent the removal of the jaws from the carriage when said jaws are in said open position, said holding means comprising a permanent holding contour on the surface said jaws, and a permanent holding contour of the surface of said cavity, such that when the jaws assume their open position the permanent holding contours abut and prevent removal of said jaws, but when said jaws assume their closed postion the permanent holding contours do not abut and the jaws can be removed from said carriage, such that said jaws are held within said carriage at the open position substantially only by said permanent contours;

wherein the carriage is axially movable with respect to said body; and

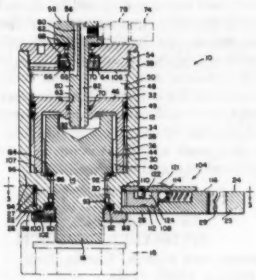
means are provided to rotate the carriage to thereby rotate the jaws, to in turn rotate the stud into a work piece.

4,513,644

FLUID POWERED TORQUE WRENCH

Paul P. Weyer, 48811 - 284th Avenue S.E., Enumclaw, Wash. 98022

Filed Dec. 28, 1983, Ser. No. 566,320
Int. Cl.[3] B25B *13/48*
U.S. Cl. 81—57.39 11 Claims



1. A fluid-powered torque wrench connectible to external fluid lines, comprising:

an outer elongated cylindrical body having ports for introducing pressurized fluid therein;

an output shaft with exterior helical splines rotatably supported within said body and having a drive end for detachably securing a socket or other tool thereto for engaging and driving a nut, screw, or the like by rotation of said shaft;

a linear-to-rotary transmission means disposed within said body and operable to provide relative rotational movement between said shaft and said body, said transmission means including a piston sleeve with exterior and interior helical splines and having a piston head for application of fluid pressure to a first side of said head to produce linear movement of said piston sleeve in a first direction, and for application of fluid pressure to an opposite second side of said head to produce linear movement of said piston sleeve in an opposite second direction, and further including spline means substantially stationary relative to said body for meshing with said exterior piston sleeve splines, said interior piston sleeve splines meshing with said exterior shaft splines, whereby linear movement of said piston sleeve in said first direction rotates said shaft to drive said nut, screw or the like and urges said body to rotate in a first rotational direction under the rotational counterforce occurring thereby, and movement of said piston sleeve in said second direction with said shaft held substantially stationary urges said body to rotate in an opposite second rotatonal direction under the rotational counterforce occurring thereby;

an elongated lever arm having a head end portion for rotatably receiving and supporting said body, with said drive end of shaft extending transversely thereto, and a handle end portion for holding said lever arm stationary;

a ratchet operative between said nead end portion and said body for preventing rotational movement of said body relative to said lever arm in said first rotational direction and permitting rotational movement of said body relative to said lever arm in said second rotational direction, said ratchet means converting the relative rotational movement between said shaft and said body resulting from the application of fluid pressure to said first side of said piston into rotation of said shaft relative to said lever arm for driving said nut, screw or the like by preventing rotation of said body in said first rotational direction, and said ratchet means converting the relative rotational movement between said shaft and said body resulting from the application of fluid pressure to said second side of said

piston into rotation of said body relative to said lever arm for repositioning said piston within said body for another driving stroke of said piston by permitting rotation of said body in said second rotational direction when said shaft is held substantially stationary; and

a stem axially aligned with said body and projecting from the exterior of said body through an end cap thereof and through said piston head, said stem being rotatably received by said end cap and said head, and slidably engaging said head, said stem extending sufficiently into said body to engage said head during the entire travel of said head within said body, and having a pair of interiorly disposed conduits, said one conduit communicating fluid between one of the external fluid lines and said first side of said head, and said other conduit communicating fluid between another of the external fluid lines and said second side of said head, said stem being in fluid-sealed relation with said end cap and said head.

4,513,645

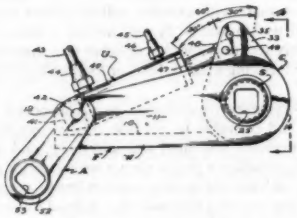
HYDRAULIC WRENCH

Bosko Grabovac, and Ivan N. Vuceta, both of P.O. Box 8830, City of Industry, Calif. 91748

Continuation-in-part of Ser. No. 337,535, Jan. 7, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 575,568

Int. Cl.³ B25B *13/46*

U.S. Cl. 81—57.39 **7 Claims**



1. A hydraulic wrench comprising an elongate horizontal frame with front and rear ends and laterally spaced side walls, a pair of axially aligned openings in the front end portion of the side walls, an elongate drive shaft extending freely between and through said openings, means at the shaft to establish driving engagement with work-engaging tools, an elongate crank with a lower end positioned between the side walls and having an elongate opening concentric with and through which the shaft freely extends, said crank has an upper end spaced radially from the axis of the shaft, an elongated double acting cylinder and ram unit with front and rear ends, connecting means pivotally connecting the rear end of the unit to the rear end of the frame and coupling means pivotally coupling the front end of the unit to the upper end of the crank, said unit operates to pivot the crank circumferentially forwardly and circumferentially rearwardly about the axis of the shaft; ratchet means between the shaft and the crank releasably establishing driving engagement therebetween when the crank is pivoted forwarded and establishing overriding engagement therebetween when the crank is pivoted rearward, said ratchet means includes an elogate ratchet wheel on and projecting radially outward from the shaft, the wheel is greater in axial extent than in radial extent and extends longitudinally of the shaft between the ends thereof, said wheel has a plurality of elongate longitudinally extending circumferentially spaced radially outwardly projecting teeth substantially coextensive with the longitudinal extent of the wheel and the opening in the crank, said teeth have elongate longitudinally extending circumferentially rearwardly and radially outwardly disposed flat rear drive flanks and elongate longitudinally extending circumferentially forwardly and radially outwardly disposed flat orienting flanks, the adjacent drive and orienting flanks of adjacent teeth are on right angularly related planes; a plurality of elongate longitudinally extending radially inwardly opening recesses in the crank in uniform circumferential spaced relationship about and coextensive with the opening in the crank, the recesses have circumferentially forwardly and radially inwardly disposed rear bearing surfaces coextensive with and extending longitudinally thereof; a plurality of elongate pawls substantially equal in longitudinal extent with and extending parallel with and longitudinally of the teeth and the recesses, the pawls have longitudinally extending circumferentially rearwardly and radially outwardly disposed rear bearing edges pivotally engaged in the rear bearing seats of related recesses, longitudinally extending circumferentially forward and radially inward disposed flat drive surfaces normally opposing and in flat uniform bearing engagement with the drive flanks of related teeth, longitudinally extending circumferentially rearwardly and radially inwardly disposed flat inner orienting surfaces normally opposing and in flat uniform bearing engagement with the orienting flanks of related teeth and outer surfaces disposed substantially radially outwardly toward their related recesses, the width of the pawls between their bearing edges and drive surfaces is less than one-half their longitudinal extent, said pawls are pivotally movable about the turning axes of their bearing edges and radially outward relative to their related recesses and from engagement with the ratchet wheel and into said recesses; and spring means in the recesses engaging the pawls and normally yieldingly urging the pawls radially inwardly into engagement with the wheel.

4,513,646

NUMERICALLY CONTROLLED MACHINE TOOL

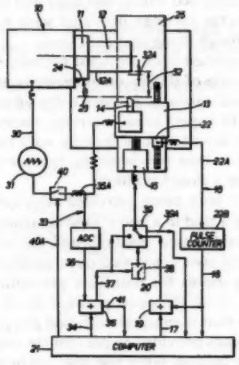
David R. McMurtry, Wotton-under-Edge, England, assignor to Renishaw Electrical Limited, Wotton-under-Edge, England

Filed Jun. 1, 1982, Ser. No. 384,100

Claims priority, application United Kingdom, Jun. 17, 1981, 8118665

Int. Cl.³ B23B *1/00, 25/06*

U.S. Cl. 82—1 C **5 Claims**



1. A method of operating a machine tool whereby a tool and workpiece are moved into engagement with each other, said machine tool having a datum surface established on a part thereof, comprising the steps of

moving said tool and said datum surface into engagement with each other;

separating said tool and said datum surface by a first distance;

generating a first feedback signal corresponding to said first distance;

moving said tool and said workpiece toward each other under the control of a first closed loop system in response to a first error signal corresponding to the difference between a first demand signal and said first feedback

signal, the distance between said tool and said workpiece being defined as a second distance;

sensing when said tool and said workpiece are separated by a second distance equal to a predetermined threshold value;

generating a second feedback signal corresponding to said second distance; and

switching control, in response to said second feedback signal, of the relative positions of said tool and said workpiece from said first closed loop system to a second closed loop system when said second distance is equal to said threshold value; and

continuing to move said tool and said workpiece toward each other under the control of said second closed loop system in response to a second error signal corresponding to the difference between a second demand signal and said second feedback signal.

2. A numerically controlled machine tool including means for supporting a tool and a workpiece for relative movement therebetween, said machine tool having a datum surface established thereon, comprising

motor means for moving said tool and workpiece relative to each other;

a first closed loop system including a first demand signal generating means and a first feedback signal generating means, said first feedback signal generating means generating a signal corresponding to the distance between said tool and said datum surface;

a second closed loop system including a second demand signal generating means and a second feedback signal generating means, said second feedback signal generating means generating a signal corresponding to the distance between said tool and said workpiece;

sensing means for determining when the distance between said tool and said workpiece has a predetermined value;

switching means for selectively coupling said first and second closed loop systems to said motor means, said switching means transferring actuation of said motor means from said first closed loop system to said second closed loop system when the signal generated by said second feedback signal generating means has a value corresponding to said predetermined threshold distance between said tool and said workpiece, said motor means being actuated by a first error signal corresponding to the difference between the signal generated by said first demand signal generating means and the signal generated by said first feedback signal generating means when said motor means is coupled by said switching means to said first closed loop system, and by a second error signal corresponding to the difference between the signal generated by said second demand signal generating means and the signal generated by said second feedback signal generating means when said motor means is coupled by said switching means to said second closed loop system.

4,513,647

PORTABLE PNEUMATIC WIRE CUTTER

Peter Eckelt, New Cumberland, and James A. Taylor, Jr., Camp Hill, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 273,631, Jun. 15, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,276

Int. Cl.³ B26D *5/26*

U.S. Cl. 83—203 **7 Claims**

1. A two cycle cutter assembly for severing an end of a multiconductor flexible cable, said assembly comprising

a frame member having two upright side members capable of supporting at least one feed reel containing multiconductor flexible cable,

multiple cable guide or support members and a horizontal mounting plate connecting the side members,

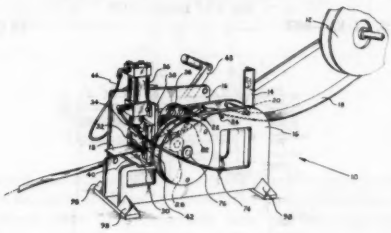
a first cable feed roller supported between the upright side members on a shaft connecting the side members,

a second cable roller mounted on a pressure release arm pivotable mounted at one end to a shaft connecting the side members, the second cable roller movable towards and away from the first cable feed roller in response to movement of the pressure release arm,

an air cylinder mounted on the frame above the horizontal mounting plate,

a blade support mounted on the frame between the air cylinder and the horizontal mounting plate,

a bottom knife blade fixedly mounted within the blade support and an upper knife blade movable within the blade support in response to actuation of the air cylinder,



an adjustment plate attached to one of the upright side members controlling maximum movement of the cable during a first cycle of the cutter, the adjustment plate being movable on the same side member within multiple adjustment slots, the position of the adjustment plate in the slots determining the maximum movement of the cable,

the cable being capable of moving from the reel between the first and second cable rollers and between the upright side members to a position between the knife blades in response to actuation of the first feed roller, and the cable capable of being severed after reaching the point of the maximum movement.

4,513,648

METHOD AND APPARATUS FOR OBTAINING SHEETS FROM A FLEXIBLE MATERIAL, PARTICULARLY A LATEX COAGULUM

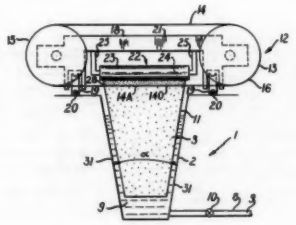
Robert Mioche, Durtol, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jun. 10, 1983, Ser. No. 502,977

Claims priority, application France, Jun. 10, 1982, 82 10283

Int. Cl.³ B26D *1/46, 3/28, 7/01*

U.S. Cl. 83—871 **23 Claims**



1. A method for obtaining sheets from a flexible material, characterized by the following features:

(a) the material is floated in a fluid so that a part of the material emerges above the fluid;

(b) a depression is produced on a portion of the emerged part by the use of depressing means;

(c) sheets are cut off from the depressed portion by the use of cutting means; and

(d) the thickness of the sheets is adjusted by varying the difference in height between the level of the depressing means and the level of the cutting means in the depressed portion.

4,513,649

CUTTING VITROUS SHEET CORNERS

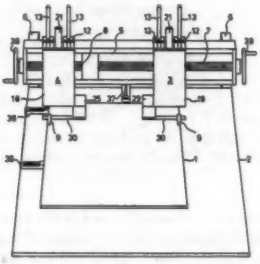
Jean-Marie Dricot, Izegem, Belgium, assignor to Mirodan, Ets. Louis D'Haene & Sons, Kortrijk, Belgium

Filed May 27, 1983, Ser. No. 498,777

Claims priority, application United Kingdom, May 28, 1982, 8215717

Int. Cl.³ B26D *3/08*

U.S. Cl. 83—883 **10 Claims**



1. Apparatus for cutting the corners of a vitreous sheet, said apparatus comprising a support for a vitreous sheet, a pair of carriages mounted above the support for relative movement so that the spacing between said carriages can be adjusted, a pair of scoring heads each mounted for arcuate movement beneath a respective carriage, and means connected for driving said heads so that their arcuate movements are in respectively opposite senses for scoring corners of a vitreous sheet located on said support.

4,513,650

ELECTRONIC MUSICAL INSTRUMENT

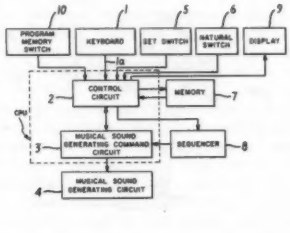
Nobuyuki Nagasaka, and Yukichi Momoshima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,918

Claims priority, application Japan, Apr. 16, 1982, 57-63286

Int. Cl.³ G10F *1/00*

U.S. Cl. 84—1.03 **11 Claims**



1. An electronic musical instrument comprising in combination: a keyboard having a plurality of white and black keys operative when depressed to produce corresponding key signals; a control circuit connected to receive the key signals; a musical sound generating circuit controlled by the key signals from said control circuit; a set switch operable to apply a semitone transfer information signal to said control circuit; a memory circuit for memorizing the semitone transfer information corresponding to certain depressed black keys according to an output signal from said set switch; said control circuit being operative to automatically transfer a semitone of said key information according to said semitone transfer information memorized in said memory whereby the instrument can play a semitone difference sound by actuation of only the white keys.

4,513,651

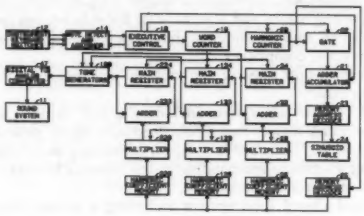
GENERATION OF ANHARMONIC OVERTONES IN A MUSICAL INSTRUMENT BY ADDITIVE SYNTHESIS

Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jul. 25, 1983, Ser. No. 517,157

Int. Cl.³ G10H *1/06*

U.S. Cl. 84—1.22 **17 Claims**



1. In a keyboard musical instrument, having a keyboard array of keyswitches, in which a plurality of data words corresponding to amplitudes of points defining the waveform of a musical tone are computed during each one of a sequence of computation cycles and transferred sequentially to a means for producing musical waveshapes, apparatus for producing a musical tone having anharmonic overtones in response to an actuated keyboard keyswitch comprising;

a plurality of harmonic coefficient memory means each of which stores a different preselected set of harmonic coefficients having a subset of zero-valued harmonic coefficients and wherein each said subset of zero-valued harmonic coefficients are selected to be mutually exclusive of any other said subset of zero-valued harmonic coefficients,

a harmonic memory addressing means whereby corresponding harmonic coefficients are simultaneously read out from each one of said plurality of harmonic coefficient memory means,

a plurality of waveshape memory means each of which is associated with a corresponding one of said plurality of harmonic coefficient memory means,

a means for computing responsive to harmonic coefficients read out from each one of said plurality of harmonic coefficient memory means whereby a plurality of component waveshape data points are computed during each one of said sequence of computation cycles wherein each one of said plurality of component waveshape data points is computed from a corresponding one of a preselected set of harmonic coefficients stored in an associated one of said plurality of harmonic coefficient memory means and whereby each one of said plurality of component data points is stored in a corresponding one of said plurality of waveshape memory means,

a plurality of waveshape memory reading means each of which is associated with a corresponding one of said plurality of waveshape memory means whereby the component waveshape data points are sequentially and repetitively read out of each one of said plurality of waveshape memory means at different memory advance rates preselected for each one of said plurality of waveshape memory means,

a data combining means whereby said waveshape data points read out of each one of said plurality of waveshape memory means are added to produce a composite set of

waveshape data points corresponding to said musical tone having anharmonic overtones, and

a means for producing musical waveshapes responsive to said composite set of waveshape data points whereby said musical tone having anharmonic overtones is produced.

4,513,652

SOLENOID ACTUATOR FOR USE IN AUTOMATIC PERFORMANCE PIANO

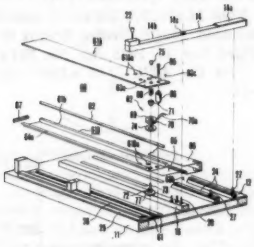
Shigeru Muramatsu, Shizuoka; Yuji Fujiwara, Hamamatsu; Hazime Hayashida, Hamamatsu, and Jun Yamamoto, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 18, 1982, Ser. No. 409,071

Claims priority, application Japan, Sep. 8, 1981, 56-132551[U]; Sep. 8, 1981, 56-132552[U]; Sep. 8, 1981, 56-132553[U]

Int. Cl.³ G10F *1/02, 3/00;* G10C *3/20*

U.S. Cl. 84—20 **10 Claims**



1. Solenoid actuators for use in a keyboard instrument including a key bed, and a plurality of keys mounted on said key bed through seesaw mechanisms, wherein said actuators comprise a plurality of electromagnetic plungers, and said actuators are disposed between said key bed and said keys for independently actuating said keys,

wherein the electromagnetic plungers for adjacent keys are displaced in the longitudinal directions of the keys so that the plungers as a whole are staggered and disposed between a single pair of integrally connected yoke members, which yoke members unite each of said plungers.

4,513,653

AUTOMATIC HYDRAULIC REVERSING VALVE FOR A DOUBLE-ACTION WORKING CYLINDER

Kurt Varlemann, Eidinghausener Strasse 117, D-4970 Bad Oeynhausen, Fed. Rep. of Germany

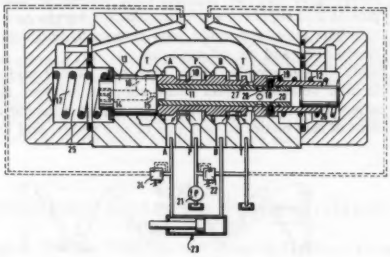
Filed May 13, 1983, Ser. No. 496,297

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218527

Int. Cl.³ F01L *15/00*

U.S. Cl. 91—239 **5 Claims**

1. An automatic hydraulic reversing valve for operating a double-action working cylinder communicating therewith, a valve housing, a control piston located in said valve housing, a return spring engaging said control piston on one side for normally maintaining the control piston in a predetermined location, the other side of said control piston communicating with a relief pressure chamber formed in said housing and being subjected to hydraulic pressure from fluid directed into said chamber, said chamber being connected on the one hand to an operating connection of said working cylinder through an intermediate relief valve that communicates with a source of said fluid, and on the other hand to a reservoir tank through a throttle orifice, a thrust piston located in said housing and being responsive to a pressure buildup in said working cylinder in actuation of said relief pressure valve for moving said control piston to a starting position from a rest position, wherein the fluid source is placed in communication with said relief pressure valve for moving said thrust piston, said control piston in the starting position thereof being operable to open said operating connection to the thrust piston side of said control piston because of negative overlap, and a blocking slide valve



mounted in said control piston and being operable upon movement of the control piston to connect the thrust piston side of the control piston to the reservoir tank, said blocking slide valve being opened by a limit stop of the control piston on the spring side and closed by a limit stop of the control piston on the thrust piston side.

4,513,654

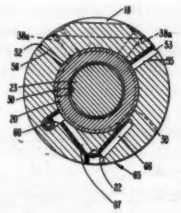
POWER STEERING GEAR WITH BALANCED VALVE

Peter H. Sheppard, R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Continuation of Ser. No. 112,294, Jan. 15, 1980, abandoned, which is a division of Ser. No. 974,347, Dec. 29, 1978, Pat. No. 4,294,161. This application Jul. 19, 1982, Ser. No. 399,698

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—378 **2 Claims**



1. In an integral hydraulic power steering gear for improving reversibility thereof and having a reciprocating piston, means to feed pressurized hydraulic fluid to said gear, and a reciprocating valve in a bore within the piston to selectively distribute the pressurized fluid to the ends of the cylinder for steering action, said feed means including a bifurcated delivery passage in said piston to feed said pressurized fluid to said valve, said fluid from said bifurcated delivery passage flowing directly around substantially all sides of said valve so as to substantially balance the valve within said bore.

4,513,655

DAMPER AND BLADE THEREFOR

Lloyd G. Dayus, 1735 Mattawa Ave., Mississauga, Ontario, L4X 1K5, Canada

Filed Nov. 30, 1983, Ser. No. 556,557

Int. Cl.³ F24F *13/08*

U.S. Cl. 98—121.2 **9 Claims**

1. An air damper comprising;

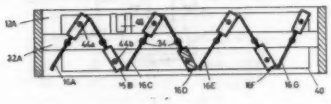
a generally rectangular frame;

blade support members on opposite sides of said frame of predetermined width and thickness;

a plurality of blade pivot pins extending normal to each such support member at spaced apart intervals therealong;

a plurality of generally linear blade members extending from side to side in said frame, said blade members having pin receiving recesses at opposite ends thereof for receiving pins on said supporting strip members, whereby said blade members may be pivoted with respect to said frame between open and closed positions;

a blade linkage member on at least one side of said frame located between a said blade support member and an adjacent portion of said frame, extending adjacent to the ends of said blades on said side of said frame, said linkage



member being slidably movable relative to said side of said frame and defining receiving means for engaging said blade support member, and,

blade engaging formations extending from such linkage member around said blade support member into engagement with respective said blade members, movement of said blade linkage member being communicated thereby to all the said blade members simultaneously, for causing simultaneous pivotal movement of said blade members on said pivot pins wherein the linkage member defines a guide groove for receiving a respective said blade mounting member therein, said blade mounting member having a length greater than such linkage member, whereby when such linkage member is moved, such blade mounting member is held against movement.

4,513,656

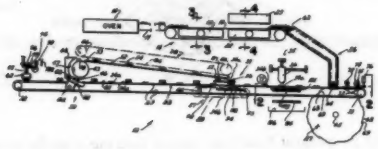
SANDWICH MACHINE

Rudolph J. Fay, 6911 Wildflower Trail, Cincinnati, Ohio 45230

Filed Jun. 29, 1983, Ser. No. 508,861

Int. Cl.³ A21C *9/04*

U.S. Cl. 99—450.4 **28 Claims**



1. A sandwich making machine for automatically making a sandwich having a topping material located between two individual objects, said machine comprising,

a row of magazine means for receiving rows of objects,

feeding means for feeding aligned rows of said objects from said magazine means into said machine,

first conveyor means for transporting said aligned rows of objects in a forward direction through said machine,

topping applicator means located in the path of travel of said conveyor for applying topping to rows of said objects,

a sandwich layering station located downstream of said topping applicator means,

second conveyor means for transporting untopped rows of objects to said sandwich layering station,

layering means at said sandwich station for placing rows of untopped objects from said second conveyor means on the tops of rows of topped objects passing said sandwich layering station,

said first conveyor means comprising multiple spaced endless conveyor belts, each of said objects in each of said rows being supported by a spaced pair of said belts, and

a topping takeoff conveyor belt located beneath said first conveyor means and beneath said topping applicator means, said topping takeoff conveyor belt being movable in a direction normal to the path of movement of said first conveyor means and being operable to receive and transport out of the machine any waste topping material deposited between the spaced belts as a result of the absence of an object on the first conveyor beneath said topping applicator means when said topping applicator means dispenses topping material.

4,513,657

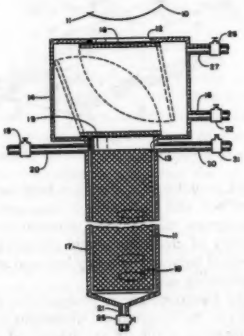
FISH FOOD OR BAIT AND METHOD AND APPARATUS FOR MANUFACTURING SAME

Ronald D. Melancon, 1604 E. Bridge, Breaux Bridge, La. 70517

Filed Nov. 14, 1983, Ser. No. 551,678

Int. Cl.³ A23K *1/18*; A23B *7/16*

U.S. Cl. 99—472 **1 Claim**



1. An apparatus for saturating porous articles with a fish attractant liquid to form fish food or bait, which comprises

(a) a pressure vessel for receiving said porous articles;

(b) a basket for containing said articles within said pressure vessel;

(c) a first valve connected to said pressure vessel for pressurizing said pressure vessel;

(d) a second valve connected to said pressure vessel for creating a vacumn in said pressure vessel;

(e) a third valve connected to said pressure vessel for introducing said fish attractant liquid into said pressure vessel; and

(f) means for sealing said pressure vessel, said sealing means including

(1) an airlock chamber connected to said pressure vessel, said air lock chamber having a first opening communicating with said pressure vessel and a second opening communicating with said pressure vessel, said second opening also communicating with the exterior of said airlock chamber,

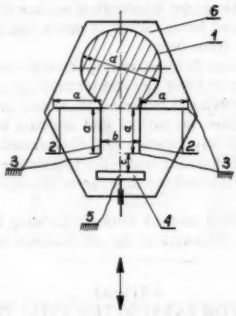
(2) a first inwardly opening door mounted in said airlock chamber for closing said first opening when a vaccumn is created in said pressure vessel, and

(3) a second inwardly opening door mounted in said airlock chamber for closing said second opening when said pressure vessel is pressurized, said airlock chamber also including a valve connected thereto for pressurizing said chamber to close said first and second doors.

4,513,658
CONTAINER FOR ACTIVATION OF MICROBIOPHYSICAL PROPERTIES OF SUBSTANCES ESPECIALLY FOOD-STUFFS

Ryszard Balinski, and Marek Sokulski, both of Warsaw, Poland, assignors to Osrodek Badawczo-Rozwojowy Aparatury Mleczarskiej, Warsaw, Poland

Filed Sep. 22, 1982, Ser. No. 421,387
Claims priority, application Poland, Sep. 22, 1981, 233126
Int. Cl.³ A23B 4/00, 7/00
U.S. Cl. 99—485 2 Claims

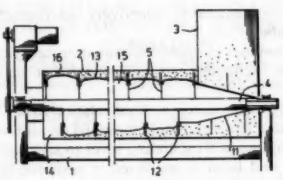


1. A container for activation of microbiophysical properties of a substance, especially food-stuffs and the like, comprising an upright cylinder mounted on a base and made of sheet metal, or the like, having a diameter (d) and a height, a portion of the side of the cylinder being open along the full height thereof, the width of said opening having a dimension (g), a pair of right angle plate member also formed of sheet metal or the like, and connected to the vertical edges defining said open side of said cylinder and arranged to be parallel to the vertical axis of said cylinder, each of said plates consisting of a pair of right angle flanges having a length of a dimension (a), and the remote edges thereof being electrically grounded, said plates being spaced apart by a dimension (b) corresponding to the side opening of said cylinder, a vertically arranged plate mounted on said base for radial movement toward and away from said cylinder and spaced from the edges of said right angle plate members by a distance (c), said movable plate also being electrically grounded, and a cover having a diameter (d) mounted above the top of said cylinder.

4,513,659
PRESS FOR THE EXPRESSION OF LIQUID FROM LIQUID-CONTAINING SUBSTANCES

Oskar Braun, Lindenfels, Fed. Rep. of Germany, assignor to Josef Willmes GmbH, Bensheim, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,086
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224086; May 13, 1983, 3317448
Int. Cl.³ B30B 9/14
U.S. Cl. 100—117 15 Claims



1. Press for expression of liquid from liquid-containing substances, namely agricultural and chemical products, with a container which has a filling- and an emptying-opening and within the container there is located a pressure membrane consisting of a flexible or elastic material which divides the interior into a pressure means- and press-space, characterized in that

(a) in the interior of the stationary container (2) a screw-conveyor (4) is located, and

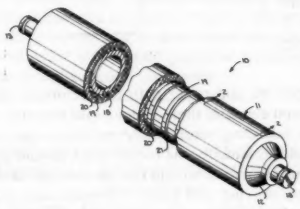
(b) the screw-conveyor (4) is covered over by the pressure membrane (13, 13') secured in a pressure-tight fashion to selected portions of the screw conveyor to rotate therewith, and

(c) the space (15) between the screw vanes (5) and the screw shaft (6) is the space for the pressure means.

4,513,660
IMPRESSION ROLLER FOR LIMITING CHARGE DISTRIBUTION

George B. Brands, Wilmette, and Bruce E. Hyllberg, Gurnee, both of Ill., assignors to American Roller Company, Union Grove, Wis.

Continuation of Ser. No. 584,615, Feb. 29, 1984, abandoned. This application Aug. 24, 1984, Ser. No. 644,645
Int. Cl.³ B41F 13/18
U.S. Cl. 101—1 3 Claims



1. A machine roller for conducting electrical current from a first region of relatively higher voltage to a second region of relatively lower voltage, the roller comprising:

an elongated body including an insulated cylindrical core and a layer of semiconductive material extending around the insulated core to provide the first and second regions of differing electrical voltage when electrical current is conducted through the semiconductive layer; and

a set of conductive elements spaced longitudinally along the body of the roller, each conductive element encircling the insulated core and contacting the semiconductive layer beneath the outer surface thereof, and each conductive element having an electrical resistance of at least two orders of magnitude less than the electrical resistance through twice the thickness of the layer of semiconductive material; and

the roller providing greater electrical resistance in the longitudinal direction than in the circumferential direction to limit electrical current in regions of the roller extending longitudinally beyond the first region of relatively higher voltage.

4,513,661
DOT MATRIX LINE PRINTER

Raymond F. Melissa, Santa Ana; Lorne H. Grummett, Costa Mesa, and John C. Chamberlain, Irvine, all of Calif., assignors to Trilog, Inc., Irvine, Calif.

Continuation of Ser. No. 259,697, May 1, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 482,133
Int. Cl.³ B41J 3/12
U.S. Cl. 101—93.04 22 Claims

1. A printing apparatus defining an elongated paper path and

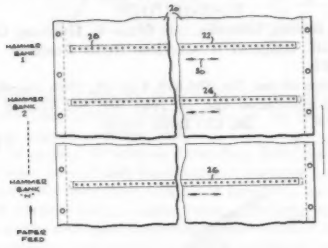
including means for moving paper along said path and means for printing a dot pattern on said paper in response to data signals defining a dot pattern for each of multiple dot rows to be printed, said apparatus comprising:

a plurality of print assembly banks including at least first and second banks;

said first print assembly bank including a plurality of print assemblies, each including a print element, mounted so as to align all of the print elements thereof along a first print row;

said second print assembly bank including a plurality of print assemblies, each including a print element, mounted so as to align all of the print elements thereof along a second print row;

means mounting said first and second print assembly banks



adjacent to said paper path for reciprocal movement of the print elements thereof along said first and second print rows extending substantially parallel to one another and across substantially the entire width of said paper path;

drive means coupled to said first and second banks for reciprocally moving said banks to sweep each print element thereof alternately in first and second directions across a portion of the width of said paper path;

each of said print assemblies being selectively actuatable to cause the print element thereof to print dots on paper on said path during each sweep in both said first and second directions across said paper path; and

means responsive to said data signals for concurrently actuating selected print assemblies on said first and second banks to concurrently print first and second dot rows on said paper.

4,513,662

INK FOUNTAIN DIVIDING KEY

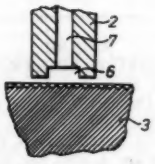
Georg Schneider, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 542,945

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241124

Int. Cl.[3] **B41F** *1/46, 31/18*

U.S. Cl. 101—207 **4 Claims**



1. An ink fountain dividing key for use in adjustably separating the surface of an ink fountain roller of uniform radius rotatable in an ink fountain of a rotary printing machine into a plurality of longitudinally spaced, separate ink applying surfaces, said ink fountain dividing key comprising:

a body having a curved front face, said curved front face having a radius of curvature the same as the uniform radius of the ink fountain roller disposed in the ink fountain, said curved front face being positioned closely adjacent and spaced from the surface of the ink fountain roller and being shiftable along the longitudinal length of the ink fountain roller;

a groove generally in the middle of said front face, said groove extending along said curved front face generally perpendicular to the longitudinal surface of the ink fountain roller and being closed at upper and lower ends of said curved front face;

a plurality of bore holes extending through said body of said ink fountain dividing key and terminating in said groove;

means for supplying compressed air to said groove through said bore holes, no part of said dividing key contacting said roller at any location said compressed air being the sole means contacting said roller to separate the surface of the ink fountain roller into separate ink applying surfaces; and

means for shifting said ink fountain dividing key longitudinally along the length of the ink fountain roller.

4,513,663

MECHANISM FOR VARYING THE AXIAL TRAVEL OF A DISTRIBUTING ROLLER IN A PRINTING MACHINE

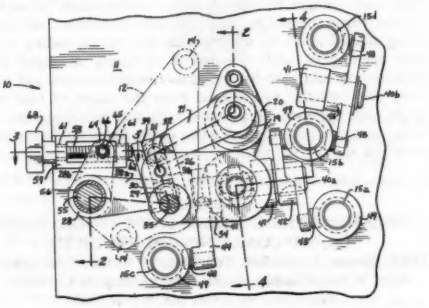
Peter Hummel, and Fred Kunkel, both of Offenbach, Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,585

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243582

Int. Cl.[3] **B41F** *31/00;* **B41L** *27/00*

U.S. Cl. 101—349 **9 Claims**



1. In a printing press having a frame and a press drive for rotating rollers therein, a mechanism for axially reciprocating at least one ink distributing roller of the press comprising, in combination,

a first pivot mounted in selectively determined relation to said frame;

a rocker member pivotably mounted on said first pivot;

means for oscillating the rocker member about the first pivot;

a second pivot mounted in fixed relation to the frame;

an oscillating lever pivotably mounted on said second pivot;

means coupling said oscillating lever to said rocker member so that said lever is oscillated in response to oscillating movement of said rocker member;

means operatively connecting the oscillating lever to the distributing roller of the press for axially reciprocating the roller in response to the oscillation of the lever; and

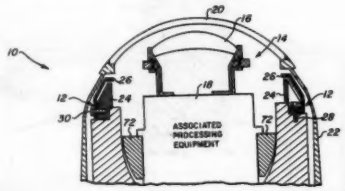
means for selectively adjusting the location of the first pivot with respect to the frame so as selectively alter the magnitude of travel of the oscillating lever and the reciprocation of the distributing roller.

4,513,664

IMPACT SWITCH FOR GUIDED PROJECTILES

David A. Edmonds, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1983, Ser. No. 494,156
Int. Cl.³ F42C *19/06*
U.S. Cl. 102—216 **20 Claims**



1. An impact switch for closing an electrical firing circuit of a guided projectile, comprising:

an annular base member formed of a non-metallic, non-conducting material fixedly secured in the forward end of the guided projectile;

an electrically-conductive film coating said annular base member over a substantial portion thereof with a portion of said film adapted for communication with the electrical firing circuit of said guided projectile;

said substantial portion of said film having an electrical discontinuity at at least one location on said annular base member to prevent eddy currents from being induced therein;

an annular crushable member formed of a non-metallic, non-conducting material mounted concentrically of, and in close proximity to, said annular base member; and

an electrically-conductive film coating said annular crushable member over a substantial portion thereof with a portion of said film adapted for communication with the electrical firing circuit of said guided projectile;

said substantial portion of said film having an electrical discontinuity at one location on said annular crushable member to prevent eddy currents from being induced therein;

whereby upon impact of said guided projectile with a target at an angle of incidence from 0° to approximately 70° said annular crushable member coated with said electrically-conductive film will be deformed into contact at at least one point with said electrically-conductive film of said annular base member to close the firing circuit of said guided projectile generating an electric current which detonates an explosive in said guided projectile.

4,513,665

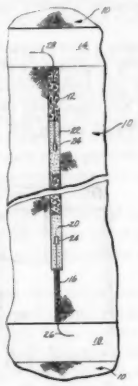
METHOD FOR LOADING EXPLOSIVE CHARGES INTO BLASTHOLES FORMED IN A SUBTERRANEAN FORMATION

Thomas E. Ricketts, and John E. Shaler, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 6, 1983, Ser. No. 501,384
Int. Cl.³ F42D *3/00*
U.S. Cl. 102—312 **27 Claims**

1. A method for loading explosive charges into a blasthole formed in a subterranean formation between two void spaces, the method comprising the steps of:

placing a first explosive charge in a portion of the blasthole adjacent a first void space, the first explosive charge comprising at least one detonator operationally connected to a first explosive initiating lead that extends into the first void space; and



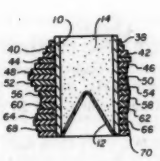
placing a second explosive charge in another portion of the blasthole adjacent a second void space, the second explosive charge comprising at least one detonator operationally connected to a second explosive initiating lead that extends into the second void space.

4,513,666

CONFINEMENT FABRICATION TECHNIQUE FOR ASYMMETRICALLY CONFINED SHAPED-CHARGE WARHEADS

Steven B. Segletes, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1983, Ser. No. 553,208
Int. Cl.³ F42B *13/10*
U.S. Cl. 102—476 **5 Claims**



1. A shaped-charge warhead confinement fabrication consisting of a series of stacked disks having non-concentric holes therein, a symmetric shaped-charge warhead having a given outer diameter, said holes having a diameter matching said outer diameter of said warhead, said warhead passing through said disk holes, thereby providing an asymmetrically shaped warhead.

4,513,667

HAND GRENADE SAFETY DEVICE

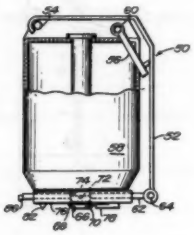
Anthony M. Caruso, 1620 Dallas St., Aurora, Colo. 80010

Continuation-in-part of Ser. No. 418,758, Sep. 16, 1982, abandoned. This application Nov. 25, 1983, Ser. No. 554,782
Int. Cl.³ F42B *27/00*
U.S. Cl. 102—487 **4 Claims**

1. A safety mechanism for a hand grenade comprising a

casing, a detonator fitting secured to one end of said casing, as safety handle mounted on said detonator fitting, a latch extending across the other end of said casing, and pivotally connecting an outer end of said handle, a detent engaging said latch in order to immobilize said safety handle relative to said grenade casing in order to provide a safety mechanism for the hand grenade;

said detent comprising a post protruding from the bottom of said casing and in alignment with said latch, the outer terminus of said post being formed as an enlarged head, said head being bifurcated into two resilient wings by a slot disposed along an axis of said post;



said latch having an aperture for engagement with said post, said head being oversized relative to said aperture to provide for an inward deflection of said wings into said slot during a passage of said latch aperture over said head; and wherein

said mechanism further comprises a slide translatably mounted on said latch for movement in a direction generally parallel with the bottom of said casing for engagement with said post, said slide including a tooth in alignment with and oriented for insertion within said slot in a direction generally parallel with the bottom of said casing to prevent said wing deflection, thereby retaining said latch on said post.

4,513,668

WEAR REDUCING PROJECTILE

Peter W. W. Fuller, Bromley, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB82/00242, § 371 Date Apr. 18, 1983, § 102(e) Date Apr. 18, 1983, PCT Pub. No. WO83/00737, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 4, 1982, Ser. No. 499,761

Claims priority, application United Kingdom, Aug. 18, 1981, 8125239

Int. Cl.³ F42B *11/20*

U.S. Cl. 102—511 **8 Claims**

1. A wear-reducing projectile, comprising:

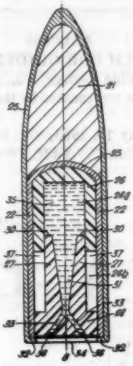
a propellant-opposable rear wall transverse to a lengthwise axis of said projectile;

a recess within said rear wall containing a charge of gun barrel wear-reducing additive;

a piston slidably located within said recess and having a forward face adjacent said charge and having a propellant opposable rear face; and

at least one additive extrusion port extending rearwardly through said piston from said recess to the exterior of the projectile; wherein

firing of said projectile causes said piston to be accelerated toward said charge and force said charge from the projectile through said at least one extrusion port with a degree



substantially in accordance with the wear-severity distribution of an associated gun barrel.

4,513,669

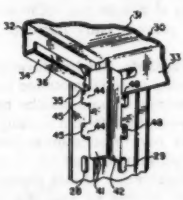
SHELVING STRUCTURE AND CLIP USED THEREIN

Mark H. Steinke, Montgomery, Ill., assignor to Lyon Metal Products, Incorporated, Aurora, Ill.

Filed Jan. 3, 1983, Ser. No. 455,195

Int. Cl.³ A47B *3/00*

U.S. Cl. 108—111 **20 Claims**



12. Shelving structure comprising an upright post including substantially perpendicular first and second post flanges, said first post flange having a first column of apertures, said second post flange having a second column of apertures, the apertures in said first column being respectively laterally aligned with corresponding apertures in said second column, each of said post flanges having an inner surface and an outer surface; a clip including first and second clip flanges substantially perpendicular to each other, a pair of first fingers coplanar with said first clip flange and extending outwardly therefrom, a pair of first coplanar hooks carried respectively by said first fingers and being substantially perpendicular thereto, a pair of second fingers coplanar with said second clip flange and extending outwardly therefrom, a pair of second coplanar hooks carried respectively by said second fingers and being substantially perpendicular thereto, said first fingers being respectively disposed within two of said first apertures, said first hooks facing the outside surface of said first post flange, said first clip flange having an edge spaced from and substantially parallel to the inner surface of said first post flange, said second fingers being respectively disposed within corresponding ones of said second apertures, said second hooks facing the outside surface of said second post flange, said second clip flange having an edge spaced from and substantially parallel to the inner surface of said second post flange; and a shelf including a substantially rectangular top wall and a pair of first shelf flanges depending

from opposite sides of said top wall, and a pair of second flanges depending from the two remaining sides of said top wall, one of said first shelf flanges being disposed in the space between said first post flange and said clip and resting on one of said first fingers, and the adjacent second shelf flange being disposed in the space between said second post flange and said clip and resting on one of said second fingers.

4,513,670

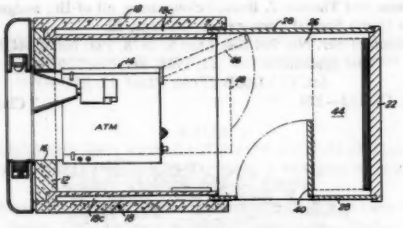
TELLER MACHINE ENCLOSURE

James Berman, 160 E. 93rd St., New York, N.Y. 10028

Filed Oct. 20, 1981, Ser. No. 313,209

Int. Cl.³ G07G *5/00*

U.S. Cl. 109—24.1 **6 Claims**



1. A teller machine enclosure comprising walls, a base, a roof and a movable wall component movable between a closed position and an extended position and which movable wall component is provided with walls, a ceiling, and an entry door so that when the movable wall component is in its extended position, there is established a service enclosure contiguous with the area enclosed by said teller machine enclosure, and wherein an automatic teller machine, having customer operated controls, is mounted in said teller machine enclosure so that the customer operated controls are accessible from outside the teller machine enclosure, and servicing of the machine is performed from the service enclosure formed when the movable wall component is in its extended position.

4,513,671

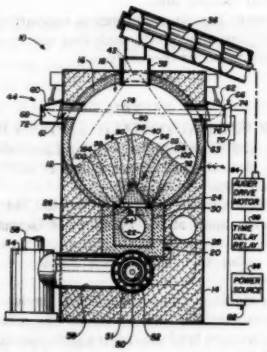
PARTICLE FUEL DELIVERY CONTROL DEVICE

Roger D. Eshleman, Waynesboro, Pa., assignor to Eshland Enterprises, Inc., Greencastle, Pa.

Filed Jul. 20, 1984, Ser. No. 632,925

Int. Cl.³ F23K *3/22*

U.S. Cl. 110—101 CF **3 Claims**



1. In a particle fuel burning furnace having an upper particle fuel holding and combustion chamber, a lower combustible gas afterburning chamber in flow communication with said upper chamber and means for delivering particle fuel into said upper chamber to form a pile of said fuel therein, a particle fuel delivery control device comprising:

(a) means forming a pair of openings in opposite sides of said upper chamber, said means including a pair of combustion air intake valves movable between open and closed positions; and

(b) means mounted outside of said furnace adjacent each of said openings for generating and transmitting a light beam through said openings and across said upper chamber, said light beam generating means including

(i) a photoelectric cell mounted outside of and adjacent to one of said openings in said upper chamber for transmitting a light beam across and receiving said beam back from said upper chamber, and

(ii) a reflector mounted outside of and adjacent to the other of said openings in said upper chamber for receiving and reflecting said transmitted light beam back to said cell;

(c) said light beam generating means operatively connected to said particle fuel delivering means such that absent interruption of said light beam by said particle fuel pile in said upper chamber said delivering means is activated to deliver more particle fuel into said upper chamber and onto said pile thereof whereas upon interruption of said light beam by said particle fuel pile said delivering means is deactivated to cease delivery of particle fuel into said upper chamber.

3. In a particle fuel burning furnace having an upper particle fuel holding and combustion chamber, a lower combustible gas afterburning chamber in flow communication with said upper chamber and means for delivering particle fuel into said upper chamber to form a pile of said fuel therein, a particle fuel delivery control device comprising:

(a) means forming a pair of openings in opposite sides of said upper chamber; and

(b) circuit means for sensing the presence and absence of said particle fuel pile at a predetermined level in said upper chamber for controlling operation of said particle fuel delivering means, said circuit means including

(i) means mounted outside of said furnace adjacent each of said openings for photoelectrically sensing said pile at said level in said upper chamber,

(ii) means for driving said particle fuel delivering means, and

(iii) a source of power for said drive means,

(iv) said driving means, power source and photoelectric sensing means forming a closed circuit for activating operation of said particle fuel delivering means upon said sensing means sensing the absence of said particle fuel pile at said predetermined level in said upper chamber and forming an open circuit for deactivating operation of said particle fuel delivering means upon said sensing means sensing the presence of said particle fuel pile at said predetermined level in said upper chamber.

4,513,672

EMBROIDERY SEWING MACHINE

Ikuo Tajima, Nagoya, Japan, assignor to Tokai Industrial Sewing Machine Co., Ltd., Kasugai, Japan

Filed Jul. 27, 1983, Ser. No. 517,839

Claims priority, application Japan, Nov. 22, 1982, 57-205281; Nov. 22, 1982, 57-205282

Int. Cl.³ D05C *3/02*

U.S. Cl. 112—100 **5 Claims**

1. An embroidery sewing machine having a needle bar driving mechanism and a thread take-up mechanism whereby a piece of needle thread and a piece of lockstitch bobbin thread join in the formation of lockstitch seams comprising:

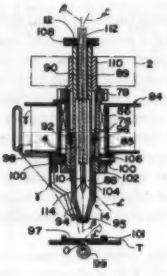
a rotating mechanism for a cylinder and bobbin having a cylinder and a rotary ring mounted thereon and rotatable

therewith around a needle, and a bobbin which is mounted on the rotary ring rotatable therewith,

a first shaft,

a device for transmitting the rotation of the first shaft to the cylinder to be rotated,

a cylinder lifting mechanism including an L-shaped arm and



a linking means which transmits the up and down lifting motion of said L-shaped arm to the cylinder and an eccentric cam means for moving said L-shaped arm up and down, and

a retainer member and a supporting arm retaining the L-shaped arm at a predetermined position and with which the retainer member is engaged.

4,513,673

STITCH INTERRUPTING DEVICE FOR SEWING MACHINES

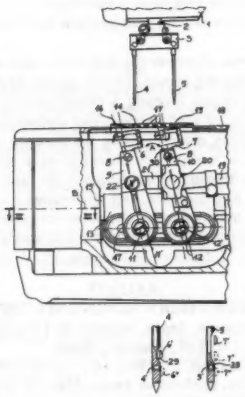
Gianfranco Brusasca, Cornaredo, and Franco Garzulano, Gallitate Novara, both of Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Oct. 4, 1982, Ser. No. 432,586

Claims priority, application Italy, Oct. 16, 1981, 24527 A/81

Int. Cl.³ D05B *1/10, 69/28*

U.S. Cl. 112—166 **4 Claims**



1. A device for interrupting the formation of at least one line of stitching in a sewing machine of the type having a support structure for pivotably supporting at least two looper holders in tandem with individual loopers mounted on each holder and at least one needle in operative association with each looper for forming spaced and parallel lines of stitching, said device comprising:

a. means defining an elongated thread hole in one of the needles;

b. means for elevating that looper associated with the needle having the elongated thread hole on its looper holder to an operating level above the looper with which it pivots in tandem; and

c. means for displacing the points of pivot of said looper holders for effecting continued formation of stitches by the combination of the needle with said elongated thread hole and said elevated looper, and a cessation of stitches by the other needle and its looper.

4,513,674

MECHANISM GENERATING ELLIPTICAL MOTION

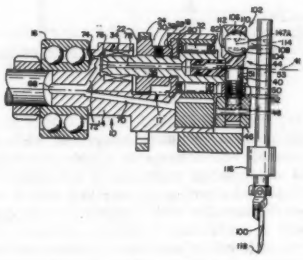
Chandrakant Bhatia, Buffalo Grove; George M. Toman, Chicago, and Thomas J. Bock, Schaumburg, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 904,204, May 9, 1978, Pat. No. 4,344,376.

This application Dec. 11, 1981, Ser. No. 329,796

Int. Cl.³ D05B *57/30;* **F16H** *37/12*

U.S. Cl. 112—220 **7 Claims**



1. A Cardan gear assembly wherein rotary motion of the input shaft results in the elliptical like output of a work performing instrumentality, said Cardan gear assembly including a pinion output lever, main bearing means subjected to generally minimum load and moment and a double speed bearing means subjected to a constant load during operation wherein the improvement comprises:

means operative to convert elliptical two dimensional motion into elliptical like three dimensional motion, connected to the pinion output lever of said Cardan gear assembly means;

a means supporting said work performing instrumentality and being connected to said means operative to convert elliptical two dimensional motion into elliptical like three dimensional motion; and

a bearing means carrying said means supporting said work performing instrumentality such that rotary and reciprocatory motion occur therebetween.

4,513,675

PRESSER FOOT AUTOMATIC LIFTING DEVICE

Horst Meyer, Bad Salzuflen, and Günter Landwehr, Bielefeld, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,744

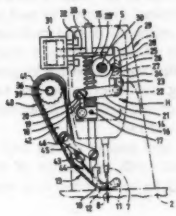
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216996

Int. Cl.³ D05B *27/06, 29/02*

U.S. Cl. 112—236 **8 Claims**

1. A sewing machine comprising a feed device for a workpiece to be sewn, said feeding device having a feed dog performing a four-motion feed movement and adapted to be positioned beneath the workpiece, a presser foot fixed to a presser foot bar, at least one needle, an arm shaft for raising and lowering said needle and a lifting gear for raising the presser foot

from the workpiece during the stitching cycle of said needle, said lifting gear being constructed in such a way that during the insertion of said needle into the workpiece during its downwardly directed movement and approximately until it reaches its bottom dead center position, the presser foot is raised from the workpiece.

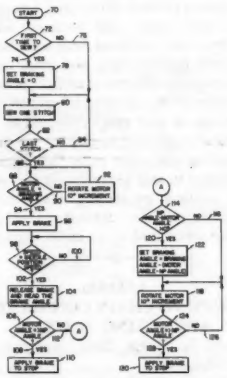


4,513,676

METHOD AND APPARATUS FOR AUTOMATICALLY DECELERATING AND STOPPING A SEWING MACHINE MOTOR

Charles R. Martell; Donald D. Isett, and Paul A. Abney, all of Dallas, Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Aug. 30, 1982, Ser. No. 412,828
Int. Cl.³ D05B *69/24, 69/26*
U.S. Cl. 112—262.1 **20 Claims**



1. A method for automatically decelerating a sewing machine motor and positioning a reciprocating needle on the sewing machine comprising:

sensing the motor angle;

decelerating the motor when the motor angle equals a predetermined braking angle to sew the desired number of stitches to complete the seam while reducing the speed to a needle positioning speed;

sensing the motor angle after deceleration to needle positioning speed and comparing the motor angle with a desired needle positioning angle;

decelerating the motor to stop reciprocation of the needle when the motor angle equals or is greater than the needle positioning angle such that needle reciprocation is stopped at the desired position in a minimum time duration without performing an additional stitch and;

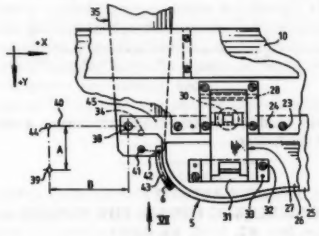
adjusting the predetermined braking angle as a function of previous braking operations to minimize the duration of the time that the motor operates at needle positioning speed.

4,513,677

METHOD AND DEVICE FOR SAFE OPERATION OF AN AUTOMATIC SEWING MACHINE

Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Koch Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,646
Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216529; Sep. 25, 1982, 3235576
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—262.3 **12 Claims**



1. A method for operating a computer with an automatic sewing machine to operate the sewing machine safely, comprising the steps of:

supplying the computer with a program for controlling a sewing contour to be produced, said program including an identification code;

providing an exchangeable workpiece clamp having a profile and an identification code readable by said computer;

controlling drive motors by said computer for generating said sewing contour within a work area having a firm reference point, said sewing contour representing a relative movement between a needle and said workpiece clamp;

applying a check step prior to a release of operation for comparing said program identification code with said workpiece clamp identification code, and

releasing a signal upon an identified matching of said both identification codes;

said check step comprising: transmitting a command by said computer to said motors for controlling a relative check motion between said needle and said profiled workpiece clamp, said check motion being limited by said reference point and a trigger point sensed by sensing means associated to a sewing head having stitch forming means with said needle, the distance between said points corresponding to said workpiece clamp identification code.

4,513,678

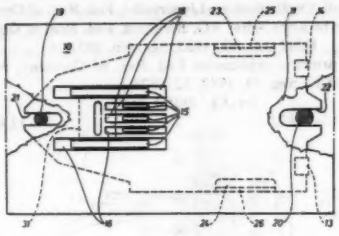
CLOTH FEEDER

Kenneth O. E. Skogward, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

PCT No. PCT/SE82/00375, § 371 Date Jun. 24, 1983, § 102(e) Date Jun. 24, 1983, PCT Pub. No. WO83/01796, PCT Pub. Date May 26, 1983
PCT Filed Nov. 8, 1982, Ser. No. 514,818
Claims priority, application Sweden, Nov. 11, 1981, 8106700
Int. Cl.³ F23M *9/00*
U.S. Cl. 112—323 **5 Claims**

1. In a cloth feeder in a sewing machine positioned below a stitch plate located in the working surface of a sewing machine, the plate having slots for the rows of teeth of the feeder, the improvement wherein, guiding means are cooperatively

arranged on the stitch plate and on the feeder respectively, to guide the centre longitudinal line of each row of teeth along



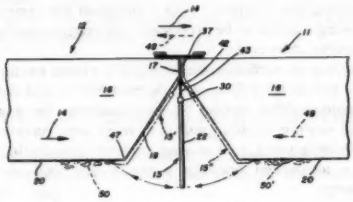
the centre line of the corresponding slot during a feeding movement of the feeder.

4,513,679

DRAG REDUCING DEVICE FOR BARGES

Sebree J. Allen, Rte. #2, Kevil, Ky. 42053

Filed Jan. 26, 1984, Ser. No. 574,018
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—67 A **7 Claims**



1. A drag reducing device for an elongated barge having a transverse dimension, an end portion, a bottom surface, and a draft line, and adapted to move longitudinally through a body of water, comprising:

(a) a mat having a transverse dimension and a depthwise dimension and transverse top and bottom edge portions,

(b) a plurality of elongated air conduits carried by said mat and extending from said top edge portion to said bottom edge portion, and transversely spaced along said mat,

(c) each air conduit having a top opening and a bottom opening,

(d) attachment means suspending said top edge portion of said mat from the end portion of a barge, so that said mat hangs transversely of the barge for free-swinging movement longitudinally of the barge, said top openings being above the draft line and the bottom openings beinq below the bottom surface of the barge, whereby movement of the barge in one longitudinal direction in a body of water causes said mat to swing in an opposite longitudinal direction.

4,513,680

BOAT STEERING MECHANISM

Makoto Teraura, Takarazuka, Japan, assignor to Nippon Cable System, Inc., Takarazuka, Japan

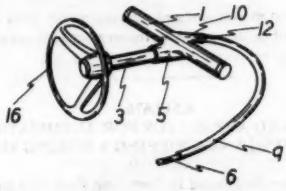
Filed Nov. 9, 1982, Ser. No. 440,332
Claims priority, application Japan, Jul. 9, 1982, 57-120125
Int. Cl.³ B63H *25/10*
U.S. Cl. 114—159 **3 Claims**

1. A boat steering mechanism for controling a remotely mounted rudder by means of a push-pull control cable having an outer cable casing and an inner cable which is slidably pushed and pulled in said outer cable casing, comprising:

a linear rack casing, said rack casing being formed with a pinion casing therein, and having a projection extending from the center thereof or its vicinity with a slight gradient as to the longitudinal direction of said rack casing;

a linear rack slidably received in said rack casing and provided with a series of teeth along a longitudinal side thereof, said rack being formed with a longitudinal groove therein for receiving said inner cable, and having a fitting member at one end of said groove for fastening one end of said inner cable to said rack;

a pinion disposed in said pinion casing and having teeth engaged and meshed with said teeth of said rack, said pinion being adapted to be attached to a steering shaft;



said projection on said linear rack casing having an inclined hole therethrough for slidably receiving said inner cable, said projection being formed with a triangular guide portion on its inner surface forming an inclined plane, said triangular guide portion projecting into said longitudinal groove in said rack, said inclined plane continuing smoothly from said inclined hole and having a concave groove therein for receiving said inner cable; and

means for connecting one end of said outer cable casing with said projection at the opening of said inclined hole;

whereby rotation of said pinion by said steering shaft will impart translatory sliding motion to said linear rack within said rack casing and exert push-pull forces on said inner cable positioned in said groove, and said inclined triangular guide portion projecting into said groove will smoothly guide said inner cable from said groove into said inclined hole when said inner cable is pushed.

4,513,681

WIRE ROPE TO CHAIN CONNECTOR FOR ANCHORING SYSTEMS

Edward J. Crook, Jr., Tulsa, Okla., assignor to The Crosby Group, Inc., Tulsa, Okla.

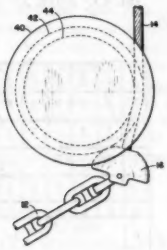
Continuation of Ser. No. 306,760, Sep. 29, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,762
Int. Cl.³ B63B *21/50*
U.S. Cl. 114—293 **8 Claims**

1. A connector for coupling a chain to a wire rope comprising:

(a) an essentially hemispherical housing having a primary opening therethrough that is axially symmetric about a radius of said housing and is perpendicular to a planar portion of said hemispherical housing, said primary opening being adapted to accept and retain, in an assembled state, a wire rope and terminal fitting of said wire rope, said terminal fitting of said wire rope being a cylindrical sleeve that accepts and retains said wire rope and wherein said cylindrical sleeve is equipped with flat surfaces on opposite sides of said cylindrical sleeve said flat surfaces of said sleeve positionable opposite said co-axial openings, and said hemispherical housing equipped with co-axial openings which radially intersect with said primary opening;

(b) a substantially semi-circular connecting link member, the ends of said link member being pivotally connected to said

hemispherical housing adjacent said planar portion, said link adapted to accept and retain a chain in said assembled state; and



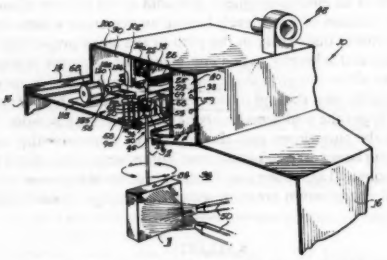
(c) a retaining pin passing through each of said co-axial openings terminating adjacent said flat surfaces to maintain said substantially semi-circular connecting link member, said terminal fitting and said hemispherical housing in said assembled state.

4,513,682

POSITIVE DRIVE ROTATOR

Tadeusz S. Otocki, Hanover Park, Ill., assignor to Protectaire Systems Co., Elgin, Ill.

Filed Mar. 24, 1982, Ser. No. 361,518
Int. Cl.³ B05B *15/04*
U.S. Cl. 118—322 **3 Claims**



1. An apparatus including a spray booth for conveying and rotating articles, said apparatus comprising:

an overhead beam support in said booth,

a conveyor for articles mounted on the overhead beam support for traveling therealong during a spraying operation,

hanging article supports attached to the conveyor and having rotatable lower portions for rotating the articles about a vertical axis,

toothed members of a predetermined vertical length connected to the rotatable lower portions to rotate the same at a predetermined number of revolutions per unit of travel by the conveyor,

an endless belt drive means depending from the overhead beam support and including an elongated endless drive belt,

an upper and lower spaced frame members on said belt drive means extending longitudinally beneath the overhead beam support,

belt sprockets rotatably mounted in said upper and lower spaced frame members at spaced locations to rotate about vertical axes,

a motor drive connected to one of the belt sprockets to drive the same at various predetermined speeds to change the number of rotations of the article per unit of conveyor travel, and

said elongated endless drive belt having a plurality of vertically extending elongated rods each of a length several times longer in the vertical direction than the predetermined vertical extent of the teeth on the toothed members to allow positioning of the toothed members at different vertical heights along the rods to distribute placement of the toothed members and wear therefrom along the rods in the vertical direction,

a protective housing about said conveyor and said upper and lower spaced frame members and having a bottom wall beneath said endless drive means and said frame members,

a slot in said protective housing through which depend said article hanging supports which are being rotated within said protective housing, and

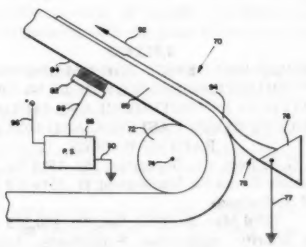
means to blow air through the slot to protect the endless belt drive means and said toothed members.

4,513,683

COATING UNIFORMITY IMPROVEMENT APPARATUS

Semyon Kisler, W. Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 222,334, Jan. 5, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,850
Int. Cl.³ B05B *5/02*; B05C *5/00*
U.S. Cl. 118—620 **11 Claims**



6. Apparatus for improving the uniformity of a wet coating deposited by an applicator arrangement on one surface of a moving web of charge-retaining material which retains residual charges following deposition, said apparatus comprising an electrode mounted in adjoining relation to the opposite side of said web downstream of the applicator arrangement at a point wherein said coating still remains wet, and means for applying a potential to said electrode to reduce the residual charge of said web and thereby enhance redistribution of the still wet coating so as to improve its uniformity.

4,513,684

UPSTREAM CATHODE ASSEMBLY

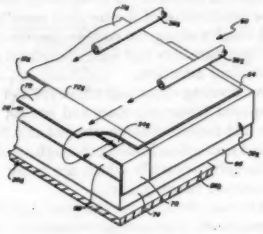
Prem Nath, Rochester, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 22, 1982, Ser. No. 452,224
Int. Cl.³ C23C *13/10*
U.S. Cl. 118—718 **22 Claims**

1. In a glow discharge deposition apparatus which includes a dedicated deposition chamber; a substrate disposed in said chamber; means for introducing process gases into said chamber, said process gases adapted to flow across a surface of the substrate; downstream glow discharge means for developing a deposition plasma region between the substrate and said glow discharge means, whereby the process gases flowing through the deposition plasma region are adapted to be deposited as a semiconductor film onto said surface of the substrate; the improvement comprising, in combination:

upstream glow discharge means disposed upstream of the

deposition plasma region, said upstream glow discharge means adapted to provide electromagnetic energy to substantially all of the process gases so as to develop an upstream plasma therefrom in an upstream plasma region



for forming a deposit; and, means for collecting said deposit, whereby the semiconductor film deposited onto said surface of the substrate is of substantially homogeneous and uniform chemical composition across the entire surface of the large area substrate.

4,513,685

METHOD AND DEVICE FOR RAISING WORMS, METHOD OF RAISING WORMS IN NUTRITION LIMITED BY INHIBITING MEANS, METHOD OF PRODUCING WORM CASTINGS, AND HOLDER FOR RAISING WORMS

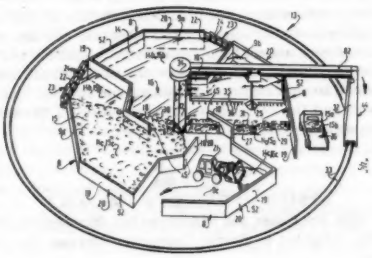
Petrus J. G. Frijters, v.d. Duynstraat 152, 2515 NL The Hague, and Antonie F. van Es, Maziestraat 18, 2514 GT The Hague, both of Netherlands

Filed Mar. 30, 1983, Ser. No. 480,375

Claims priority, application Netherlands, Apr. 7, 1982, 8201490

Int. Cl.³ A01K *67/00*

U.S. Cl. 119—1 **26 Claims**



1. A method for raising and harvesting worms in a nutrition-containing bedding comprising:

extending said bedding for defining a path by adding nutrition-containing material adjacent a portion of said bedding for inducing a worm population in said bedding to migrate along said path while said population is reproducing and increasing;

directing an accretion portion of said migrating worm population into means for separating said accretion portion from said bedding; and p1 maintaining the remaining portion of said migrating worm population in said bedding as a stock population.

4,513,686

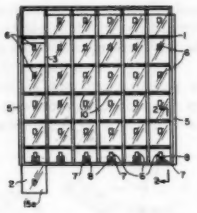
PIGEON CAGE ASSEMBLY

David J. Demko, R.D. 3 Box 232, Reading, Pa. 19606

Filed Sep. 8, 1983, Ser. No. 530,392

Int. Cl.³ A01K *31/02*

U.S. Cl. 119—15.6 **9 Claims**



1. A fully automatic cage assembly for pigeons and the like, comprising a plurality of stalls in stacked relationship arranged in a plurality of vertical rows, a unitary front door panel means slidably mounted vertically, one of said door panel means for each of said vertical rows for covering said plurality of stalls in a vertical row, a back for covering the rear of said cage assembly, a plurality of stops, one for each stall, fastened securely to said front door panel means, extending inwardly from said front door panel means, and electrically controlled arresting means at the bottom of each vertical column of stalls, operated at timed intervals so that said door panel means will be intermittently lowered to expose at least one stall at a time in a said vertical row, at timed intervals, said arresting means being in the form of an electro-magnetic solenoid at the bottom of each vertical column of stalls, each having an armature which normally extends outwardly in the path of the stops projecting in the stalls, and whereby, when energized, the armature is withdrawn to allow one stop at each solenoid energization to move downwardly past the end of the armature, means which immediately urges the said armature back out to the stop position as soon as the stop drops past the end of the armature, the said strip again being arrested as the next higher stop drops down to hit the solenoid armature a uniform time interval between each solenoid energization creating separate openings of each stall.

4,513,687

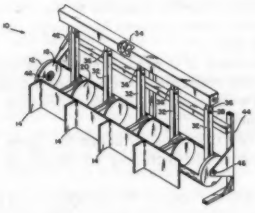
METHOD AND APPARATUS FOR FEEDING LIVESTOCK

Walter J. De Jong, 23430 High Bridge Rd., Monroe, Wash. 98272

Filed Jan. 31, 1984, Ser. No. 575,518

Int. Cl.³ A01K *5/02, 1/12*

U.S. Cl. 119—27 **4 Claims**



1. An apparatus for feeding livestock, which comprises:

an elongated manger including a plurality of longitudinally spaced-apart feeding locations therein;

means for dispensing feed into the feeding locations;

a plurality of dividing arms extending forwardly from the

manger to define feeding stalls in front of the manger corresponding to the feeding locations;

a plurality of entry control gates, each entry control gate pivotally mounted on a dividing arm such that when the gate is in a closed position, it will extend longitudinally outward from the dividing arm in a first direction to partially block a first stall adjacent the dividing arm and in a second direction to block entry to a second stall adjacent the dividing arm, the first side of the gate pivoting toward the manger and the second side pivoting away from the manger to move the gate into an open position wherein the gate extends outwardly from the dividing arm in a direction substantially aligned with the dividing arm to further define the first stall and permit entry into the second adjacent stall.

4,513,688

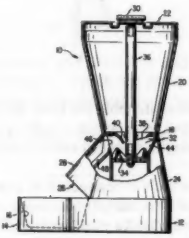
PELLETIZED MATERIAL FEEDER

Arthur L. Fassauer, P.O. Box 124, Canyon, Tex. 79015

Filed Jan. 21, 1983, Ser. No. 459,767

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—52 A **7 Claims**



1. A pellitized matter dispenser, comprising:

a hopper for storing the pellitized matter;

an agitation chamber mounted below said hopper and having upwardly and outwardly tapered sides in an inverted frusto-conical shape, said agitation chamber having a quadrilateral outlet port disposed through the upwardly tapered side thereof to allow passage of agitated pellitized matter;

an agitation assembly disposed on the bottom of said agitation chamber and having:

a rotating base rotatably mounted in the bottom of said agitation chamber and parallel therewith, and

a plurality of paddles disposed on the surface of said rotating base and radially oriented to the outer periphery thereof and perpendicular to the surface thereof,

said paddles having two flat surfaces directed perpendicular to either direction of rotation of said rotating base;

each of said paddles having a radial edge thereof tapered inwardly and upwardly from the bottom of said chamber such that a V configuration is formed with the outward tapered walls of said chamber beneath the bottom edge of said outlet port,

said radial edge urging the pellitized matter in said agitation chamber upward along the upwardly tapered walls of said chamber during rotation of said agitation assembly to exit said outlet port, the movement of the pellitized matter along the tapered walls in response to said radial edge moving through the agitation chamber allowing a substantial quantity of pellitized matter to be dispensed for each passage of one of said paddles proximate said outlet port;

means for rotating said agitation assembly at a low revolution rate; and

means for restricting flow of pellitized matter from said hopper to said agitation chamber when said agitation assembly is not rotating, said means for restricting allowing flow of particulate matter when said agitation assembly is rotating such that the amount of pellitized matter dispensed through said outlet port is replenished in said agitation chamber.

4,513,689

POULTRY-HARVESTING ASSEMBLY

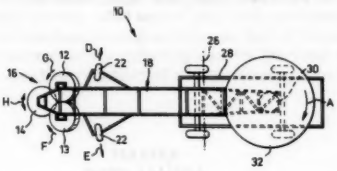
Paul S. Berry, Bromham; John A. Benson, Wootton; Peter J. Kettlewell, Manchester, and Michael J. B. Turner, Clophill, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 24, 1984, Ser. No. 603,335

Claims priority, application United Kingdom, Apr. 29, 1983, 8311814

Int. Cl.³ A01K *45/00*

U.S. Cl. 119—82 **4 Claims**



1. A poultry harvester comprising:

two rotors arranged side by side with each said rotor providing a continuous array of radially extending guide elements co-operating with the guide elements of the other rotor;

a third such rotor arranged in front of and co-operating with the other two rotors in a triangular formation;

means supporting said rotors;

drive means for rotating the rotors about vertical or predominately vertical axes so that the guide elements co-operate to capture and transmit birds between the rotors to a discharge location; and

conveyor means juxtaposed with said discharge location for elevating the captured birds and conveying them to a site which is arranged to permit removal and packing of the captured, transmitted, elevated and conveyed birds.

4,513,690

ANIMAL MUGGER

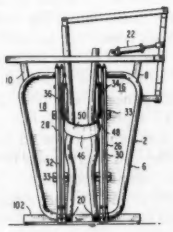
Curtis R. Waldron, Rte. 3, Box 2793, Okeechobee, Fla. 33472

Continuation-in-part of Ser. No. 414,801, Sep. 3, 1980, Pat. No. 4,467,746. This application May 11, 1983, Ser. No. 493,622

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.³ A01K *1/062;* **A61D** *3/00*

U.S. Cl. 119—99 **3 Claims**



1. A mugger for use with a cattle chute having moveable sides and pivoted entrance and exit gates to immobilize the head of a cattle held within the chute which comprises:

first and second elongated tubular members,

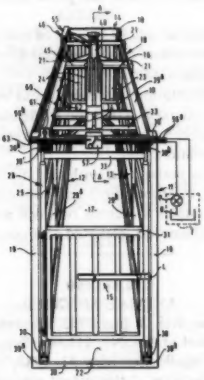
a longitudinal slot in each of said tubular members,
means to mount said tubular members vertically on the outside of the exit gate of a cattle chute with said slots facing away from said exit gate,
a first bracket member structured to slide vertically in said slot of one of said tubular members,
a second bracket member structured to slide vertically in said slot of the second of said tubular members,
a sling member fixed to said bracket members so said sling member may be moved by said bracket members from a position resting on the ground adjacent said exit gate of said animal chute to an elevated position to engage the head of an animal held in said chute,
and chain means to move said first and second bracket members vertically along said tubular members.

4,513,691

ANIMAL PENS

Kenneth E. Wood, Blakeway Farm, Harley, Nr. Shrewsbury, Shropshire, England SY5 6LT

Filed Nov. 25, 1983, Ser. No. 555,132
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—99 **6 Claims**



1. An animal pen comprising a plurality of main frame members interconnected to provide an animal receiving structure having a front end and a rear end, door means adjacent the rear end of the structure for entry of the animal head first into the pen, an advancing means including said rear door means, mounted on the main frame for movement forwardly of the frame, to engage the rear of the animal to urge the animal forwardly in the structure, a first hydraulic ram means to actuate the advancing means, said first ram means comprising a cylinder part and a piston part, one of said cylinder and piston parts being connected to the advancing means and the other of said cylinder and piston parts being connected to the main frame, a yoke means comprising a pair of closure members mounted in the frame for movement forwardly and inwardly of the frame to close around a front part of the animal, a linkage mechanism connected to the closure members, a second hydraulic ram means to actuate the yoke means, said second ram means comprising a cylinder part and a piston part, one of said cylinder and piston parts being connected to the linkage mechanism and the other of said cylinder and piston parts being connected to the main frame.

4,513,692

ILLUMINATABLE PET LEASH

Alexandra Kuhnsman, Oxford, and Marian B. Morey, Somerville, both of N.J., assignors to Alexandra Enterpises, Inc., Oxford, N.J.

Filed Apr. 30, 1984, Ser. No. 605,197
Int. Cl.³ A01K *27/00*; **A45B** *3/04*
U.S. Cl. 119—109 **14 Claims**

1. A flexible illuminatable pet leash device which comprises:
(a) an elongated tube which is non-opaque and which is of sufficient length, strength and flexibility to be used as a pet leash;
(b) a handle which is connected to one end of said tube;
(c) a pet collar attachment mechanism connected to the end of said tube opposite said handle;
(d) a set of battery operated illumination circuitry of the flashlight type, being located within said handle;
(e) an on-off switch, being connected to said set of circuitry;
(f) a light bulb, being connected to said set of circuitry and being connectively positioned with respect to said handle so as to be capable of shining away from said handle and into said tube; and,
(g) at least one bundle of optical fibers contained within said tube, said bundle being positioned in the light path of said bulb so as to be capable of fiber optic illumination within said tube, said bundle being of varied lengths of optical fibers, the longest of which is approximately the tube length, the total number of optical fibers within all of said bundles being at least forty in number.

4,513,693

DEVICE FOR TYING-UP AN ANIMAL

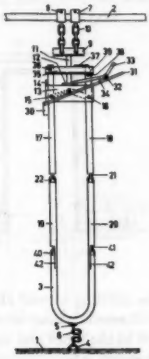
Christiaan A. C. Vandekeybus, Kloosterstraat 21, B-2190 Essen, Belgium

Filed Apr. 5, 1983, Ser. No. 482,173
Claims priority, application Belgium, Apr. 28, 1982, 2/59682; Jul. 9, 1982, 2/59771
Int. Cl.³ A01K *1/06*
U.S. Cl. 119—147 R **10 Claims**

1. A device for tying-up an animal comprising:
a suspension element,
a bottom yoke,
two legs forming with said bottom yoke a single yoke and defining with said suspension element and said bottom yoke a main yoke plane, each of said legs being comprised of:
a top part which hinges in the suspension element about an axis at right angle to the main yoke plane, and
a lower part which is connected through a first hinge to the top part and through another hinge to the bottom yoke,
the top part and the lower part of each leg being in line in a closed position of the yoke and the top parts and the lower parts of the two legs forming a parallelogram in an open

position of the yoke, the lower part of a leg extending in said open position towards the other leg up to and beyond the other hinge which forms its connection with the bottom yoke,

means which are movable between a first end position and a



second end position and which in said first end position retain the top parts in the closed position and in said second end position retain the top parts in the open position, and,

a spacer member which locks the top parts in the closed position.

4,513,694

VERTICAL RADIATION TANK

Willem Wiemer, No. 2 Veldmolen, 7491 Gn Delden, Netherlands

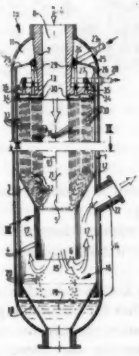
PCT No. PCT/NL83/00026, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO84/00411, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 12, 1983, Ser. No. 589,109

Claims priority, application Netherlands, Jul. 12, 1982, 8202818

Int. Cl.³ F22D *1/00*; C10J *3/48*

U.S. Cl. 122—7 R **3 Claims**



1. A vertical radiation tank (10), more particularly for gaining heat from process gases of ash forming, carbon containing fuels, comprising a vessel (11) provided inside its jacket with diaphragm pipe walls (1) traversed by a coolant and bounding a flow space to be traversed by process gases, said space having at the top a central inlet for the process gas, on the lower side an inverting space for inverting the direction of flow of the process gas and adjacent thereto at least one outlet for the cooled process gas, said inverting space being bounded by a water space for capturing therein locally separated ash particles characterized in that the diaphragm pipe walls comprise a cylindrical, first diaphragm pipe wall concentric with the jacket of the vessel and covering the length of the flow space and the inverting space, a plurality of second pipe walls radially arranged inside the former, a funnel-shaped, third diaphragm pipe wall (3) bounding the radial pipe walls (2) on their underside and a short, cylindrical fourth diaphragm pipe wall adjoining the funnel-shaped diaphragm pipe wall, the third and fourth diaphragm pipe walls being formed by pipes branched from the first diaphragm pipe wall, the cylindrical first diaphragm pipe wall is formed by U-section pipes lying wholly or partly side by side, one limb of which at the top is connected with an annular collecting duct for the water supply and the other limb is connected with an annular collecting duct for the water outlet and the radial second pipe walls are formed by a plurality of co-planar U-section pipes, one limb of which at the top is connected with a collecting duct for the water supply and the other limb is connected with a collecting duct for the water outlet.

4,513,695

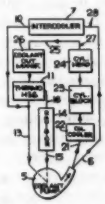
INTERCOOLER BYPASS RETURN IN AN INTERNAL COMBUSTION ENGINE

Paul Patchen, II, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 11, 1983, Ser. No. 521,992

Int. Cl.³ F01P *3/12*

U.S. Cl. 123—41.1 **5 Claims**

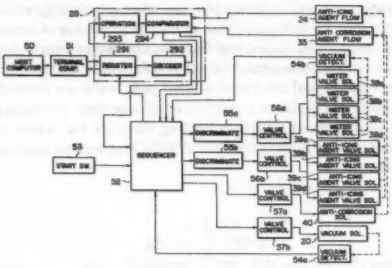


1. An engine cooling system on an internal combustion engine comprising, an internal combustion engine having the engine cooling circuit with coolant passages in said engine, a coolant pump circulating coolant in said engine cooling circuit, alternate return passages from the engine coolant passages including a bypass return conduit and a radiator for returning cooling fluid to said coolant pump, a thermostatic valve connected upstream of said bypass return conduit and said radiator selectively and alternatively diverting coolant through said bypass return conduit and said radiator responsive to the temperature of the coolant in said thermostatic valve, said thermostatic valve including a bypass chamber connected to said bypass return conduit, an intercooler cooling circuit including an intercooler, a coolant supply conduit connected to said coolant pump to said intercooler, an intercooler return conduit connected between said intercooler and said bypass chamber to return coolant from said intercooler to said coolant pump to thereby provide an improved flow rate and efficiency of said intercooler in said engine cooling system.

4,513,696
APPARATUS FOR CHARGING COOLING LIQUID TO ENGINE COOLING SYSTEM

Hiroshi Fujii, and Toshiharu Sakamoto, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed May 23, 1983, Ser. No. 496,945
Claims priority, application Japan, May 24, 1982, 57-87737; May 24, 1982, 57-87738
Int. Cl.³ F01P *11/06*
U.S. Cl. 123—41.02 **10 Claims**



1. An apparatus for charging a cooling liquid to an engine cooling system, said apparatus comprises additive reservoir means for storing at least one additive, cooling water reservoir means for storing cooling water, filler head means adapted to be connected with coolant inlet means of an automobile engine cooling system having a known volumetric capacity, additive conduit means extending between said additive reservoir means and said filler head means, cooling water conduit means extending between said cooling reservoir means, additive control means provided in said additive conduit means for controlling a quantity of the additive supplied to the engine cooling system in accordance with the capacity of the cooling system and a desired concentration of the additive, cooling water control means provided in said cooling water conduit means for controlling a quantity of the cooling water supplied to the engine cooling system in accordance with the capacity of the cooling system and the desired concentration of the additive, said additive control means includes additive flow measuring means to measure the quantity of the additive supplied to the engine cooling system, said cooling water control means including pressure detecting means for detecting a pressure in the engine cooling system, control circuit means being provided for terminating supply of the additive when a predetermined quantity is supplied and for terminating supply of the cooling water when the pressure in the engine cooling system has reached a predetermined value, whereby the cooling water is charged to the engine cooling system with the desired concentration of the additive.

4,513,697
PISTON FOR INTERNAL COMBUSTION ENGINE

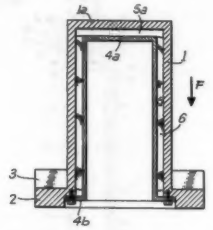
Auguste Moiroux, Ecully, France, assignor to Societe Civile Styled: BMB, Paris, France

Filed Jan. 23, 1984, Ser. No. 573,211
Claims priority, application France, Jan. 27, 1983, 83 01236
Int. Cl.³ F02P *1/04*
U.S. Cl. 123—41.35 **3 Claims**

1. A piston for an internal combustion engine, such as a free piston engine; said piston comprising:

an assembly of a pair of respectively inner and outer coaxial cylinders secured one to the other, at least the outer cylinder being hollow, the inner cylinder having an external diameter which is substantially less than the inner diameter of the outer cylinder, thus defining a closed and sealed annular chamber between said cylinders for receiving a volume of a cooling fluid less than the total volume of said chamber; and

longitudinal ribs in the closed and sealed annular chamber which ribs extend over most of the height of said chamber and are inclined in alternate directions with respect to the

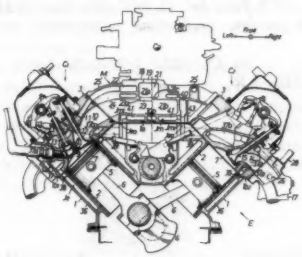


piston axis, thus defining in said chamber a first plurality of longitudinal channels whose section increases from one end of the piston to the other end and a second plurality of longitudinal channels whose section decreases from said one end to said other end.

4,513,698
INTAKE MANIFOLD STRUCTURE FOR INTERNAL COMBUSTION ENGINES

Akihisa Senga; Yoshiaki Hidaka, and Tadashi Tsuchiyama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 368,983
Claims priority, application Japan, May 20, 1981, 56-76043
Int. Cl.³ F02M *35/00*
U.S. Cl. 123—52 MV **25 Claims**



1. An intake manifold structure for an internal combustion engine, comprising:

(a) a distribution plenum chamber divided by a partition wall into a vertical first sub-chamber and a horizontal second sub-chamber,

(b) inlet opening means formed in a top wall portion of the first sub-chamber for introducing an air-fuel mixture,

(c) a communication passage formed through the partition wall and having a cross-sectional area larger that the total cross-sectional area of said inlet opening means and smaller than the cross-sectional area in the direction of air-fuel mixture flow of each of said first and second sub-chambers,

(d) a plurality of intake branch passages extending laterally from the side wall of the second sub-chamber, and

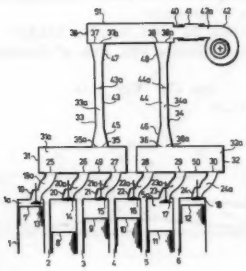
(e) a water jacket means underlying a substantial portion of said distribution plenum chamber and surrounding a substantial portion of an upper portion of said distribution plenum chamber.

4,513,699

INTAKE GAS RESONANCE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Gyula Cser, Budapest, Hungary, assignor to Autóipari Kutató és Fejlesztö Vállalat, Budapest, Hungary

Filed Feb. 22, 1983, Ser. No. 468,384
Int. Cl.³ F02B 37/04
U.S. Cl. 123—52 MB 8 Claims



1. In a reciprocating piston type internal combustion engine having a plurality of engine cylinders each including an intake opening; an intake gas resonance system associated with a group of the engine cylinders whose suction strokes do not significantly overlap; said intake gas resonance system comprising:

(a) a resonator vessel communicating with the intake openings of the cylinders of said group; said resonator vessel having a volume and an inner wall face;

(b) a resonance tube having an end operatively coupled to said resonator vessel for communicating therewith; said resonance tube having a longitudinal axis and a volume; said end of said resonance tube being located opposite said inner wall face of said resonator vessel; the distance between said end of said resonance tube and said inner wall face of said resonator vessel as measured along said longitudinal axis of said resonance tube being greater than the diameter of a circle whose area equals the cross-sectional area taken at said end of said resonance tube; said resonance tube having a diffusor means for reducing velocities of gases passing through said resonance tube into said resonator vessel; said diffusor means comprising a gradually widening diffusor portion forming part of said resonance tube and terminating in said end; said diffusor portion having cross-sectional areas continuously increasing towards said resonator vessel; a cross-sectional area taken at said end of the resonance tube perpendicularly to said longitudinal axis being at least 1.2 times greater than a cross section of minimum area of said diffusor portion with said cross section being substantially spaced from said end; and

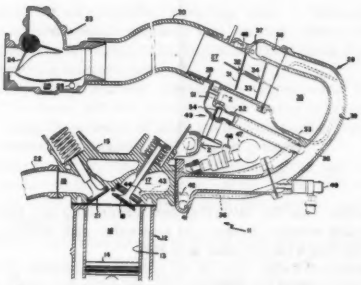
(c) a resonating space having a volume composed of said volume of said resonator vessel and an average cylinder volume related to one cycle of oscillation and communicating with said resonator vessel during one oscillating cycle; said volume of said resonating space being at least 2.5 times greater than said volume of said resonance tube.

4,513,700

INDUCTION SYSTEM FOR SPARK IGNITION ENGINE OF FUEL INJECTION TYPE

Takanori Hayashida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 16, 1979, Ser. No. 39,598
Claims priority, application Japan, May 17, 1978, 53-57681
Int. Cl.³ F02M 61/14
U.S. Cl. 123—179 L 10 Claims



1. An induction system for an internal combustion engine having a chamber of variable volume in which combustion occurs, a main induction passage terminating in a main intake port, an auxiliary induction passage terminating in an auxiliary intake port, said auxiliary intake port being disposed relative to said chamber so that said auxiliary induction passage discharges into said chamber at substantially undiminished velocity, the effective cross-sectional area of said auxiliary induction passage being substantially less than the effective cross-sectional area of said main induction passage, throttle valve means for controlling the ratio of communication of said main and auxiliary induction passages with said chamber during a given cycle of engine operation, said throttle valve means comprising a primary throttle valve and a secondary throttle valve, said primary throttle valve and said secondary throttle valve each being disposed in said main induction passage, said secondary throttle valve being positioned posterior to said primary throttle valve, said auxiliary induction passage having its inlet disposed in said main induction passage between said throttle valves wherein closure of said secondary throttle valves diverts flow into said auxiliary induction passage, and a charge forming device for delivering fuel to said chamber through at least one of said induction passages, the improvement comprising a fuel injection nozzle for delivering a cold starting and cold running enrichment to said chamber only through said auxiliary induction passage, temperature responsive means for providing additional air flow into the auxiliary induction passage when the temperature is below a predetermined temperature.

4,513,701

VALVE FOR AN INTERNAL COMBUSTION ENGINE

Rudolf Sternberg, Oberboihingen, and Martin Schnapper, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,681
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142670
Int. Cl.³ F01L 3/10
U.S. Cl. 123—188 AA 1 Claim

1. A valve for an internal combustion engine comprising a valve stem provided near an end thereof remote from a valve disk with an annular groove having a rectangular cross section and rounded-off innermost corners, characterized in that the innermost corners of the annular groove are rounded-off with

a relatively small radius at a first innermost corner and said small radius effects a transition with a cylindrical portion of the annular groove thence to an adjoining larger radius at a second innermost corner wherein the larger radius is about three times as large as the smaller radius, the valve stem has an inductively hardened outer layer which extends from the end of the valve

stem remote from the valve disk and terminating at a location between the annular groove and said valve disk wherein the valve stem has a longitudinal axis and

the hardened outer layer in the area of the annular groove extends radially toward the axis to a depth greater than the groove to provide a hardened surface for and a hardened layer below the groove.

4,513,702

INTERNAL COMBUSTION ENGINE

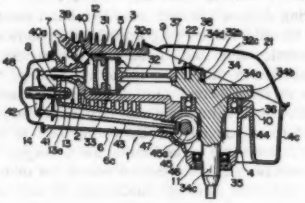
Noritaka Koga; Takanori Suzuki, both of Sakado; Kenji Nakamura, Wako; Hitoshi Suzuki, and Takeo Ogano, both of Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,260

Claims priority, application Japan, Oct. 29, 1981, 56-174338; Oct. 30, 1981, 56-162109[U]

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—193 H **2 Claims**



1. A four cycle internal combustion engine comprising:

a vertically disposed cantilever crankshaft having a shaft portion and a center axis;

a main block including a cylinder block section having an inner bore with a horizontal axis, and a crankcase half section, said cylinder block section and said crankcase half section being formed as a single body, said crankcase half section having a bearing portion for supporting said crankshaft thereon, said shaft portion of said crankshaft being supported at two points of said bearing portion, one of said points being below and near to said inner bore and the other of said points being spaced downwardly therefrom, said crankcase half section being upwardly open in a direction of said center axis of said crankshaft and also in a direction of said horizontal axis of said inner bore to define an opening which has an opening edge arranged in an inclined relationship to said center axis of said crankshaft and also to said horizontal axis of said inner bore;

a camshaft rotatably mounted in said crankcase half section and disposed perpendicularly to said center axis of said crankshaft at a position wholly between a respective horizontal plane passing through each of said two points of said bearing portion; and

a crankcase half having an inclined opening edge corresponding to said opening edge of said crankcase half section for covering said opening of said crankcase half section.

4,513,703

RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

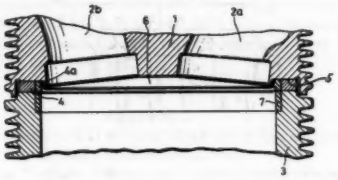
Rolf Eckert, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,897

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236185

Int. Cl.³ F02F *1/18*

U.S. Cl. 123—193 CH **4 Claims**



1. A reciprocating piston internal combustion engine, each cylinder of which comprises:

a light metal cylinder head which is provided with a combustion chamber and with an annular shaped recess which is disposed radially outwardly of the latter;

a cylinder sleeve having a thermal expansion differing from that of the cylinder head and which is adapted to be connected to said cylinder head; and

a sealing element which is disposed in said recess and forms a sealing surface between said cylinder head and said cylinder sleeve; at least that surface of said sealing element which faces said combustion chamber being provided with a heat insulating layer, said sealing element being a metal ring having a predetermined width, said heat insulating layer comprising a ceramic material, said cylinder sleeve, at that end adjacent said cylinder head, and on its radially inwardly directed surface, being provided with a heat insulating part which forms a contact surface for said heat insulating layer, said heat insulating part also comprising a ceramic material, said recess of said cylinder head having its outer periphery being wider than the width of said sealing element and said heat insulating layer forming a means to permit radial play of the sealing element via a spaced radial relationship.

4,513,704

PRESSURIZED LUBRICATION ASSEMBLY FOR MACHINERY HAVING A FLOW RESTRICTOR DEVICE

John W. Evans, Rte. 41, Sharon, Conn. 06069

Filed Dec. 2, 1983, Ser. No. 557,313

Int. Cl.³ F01M *1/00*; F02B *33/40*

U.S. Cl. 123—196 S **22 Claims**

1. An improved prelubricator and pressurized lubricant reservoir assembly for lubricating machinery, such as an internal combustion engine, when the lubricant pressure in the machinery is below a specified level said assembly comprising:

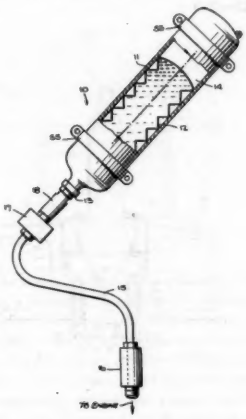
reservoir means for storing a quantity of lubricant under pressure;

conduit means for coupling said reservoir means and said machinery in fluid communication whereby lubricant

flows in said conduit means in a first direction from said machinery to said reservoir means and in a second direction from said reservoir means to said machinery;

valve means disposed in said conduit means for selectively permitting and preventing flow of lubricant in said conduit means;

flow restrictor means disposed in said conduit means, said flow restrictor means having a first operating position for providing for restricted lubricant flow in said first direction and a second operating position for providing for substantially unrestricted lubricant flow in said second direction; and



wherein said flow restrictor means comprises:

a casing having a fluid passage therethrough; and

a gate having an aperture therein pivotally mounted within said fluid passage wherein said gate assumes a closed position when said lubricant flows in said first direction whereby restricted lubricant flow from said machinery to said reservoir means through said aperture is permitted and wherein lubricant flow in said second direction opens said gate whereby substantially unrestricted lubricant flow from said reservoir means to said machinery is permitted by said open gate.

4,513,705

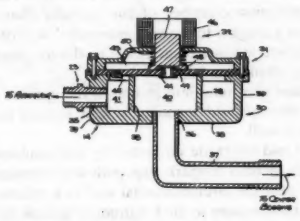
PRESSURIZED LUBRICATION ASSEMBLY FOR THE CENTER BEARING OF A TURBOCHARGER

John W. Evans, Rte. 41, Sharon, Conn. 06069

Filed Dec. 2, 1983, Ser. No. 557,321

Int. Cl.³ F02B *33/40*

U.S. Cl. 123—196 S **15 Claims**



1. A pressurized lubrication assembly for a center bearing of an exhaust-driven turbocharger associated with an internal combustion engine wherein said engine includes means for providing flow of pressurized lubricant through first conduit means to said turbocharger when said engine is running, said lubrication assembly comprising:

reservoir means for storing a quantity of lubricant under pressure;

second conduit means coupled to said reservoir means and said first conduit means for permitting flow of lubricant between said reservoir means and said first conduit means;

valve means disposed in said second conduit means for controlling flow of lubricant between said first conduit means and said reservoir means wherein said valve means includes:

means for substantially restricting flow of lubricant from said first conduit means to said reservoir means when the pressure of lubricant flowing in said first conduit means is below a selected pressure;

means for permitting substantially unrestricted lubricant flow from said first conduit means to said reservoir means when the pressure of lubricant flowing in said first conduit means is at or exceeds a selected pressure;

means for preventing flow of lubricant from said reservoir means to said first conduit means when said engine is providing flow of pressurized lubricant to said turbocharger;

means responsive to shut down of said engine for providing substantially unrestricted flow of lubricant from said reservoir means to said first conduit means and thereby said turbocharger.

4,513,706

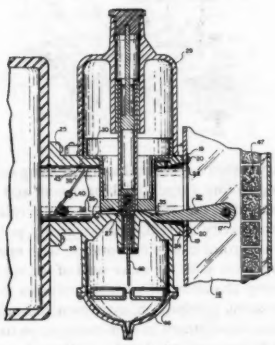
ANTI-DIESELING DEVICE FOR DEMAND CARBURETORS

Jon E. Atzet, 1754 S. 10th East, Salt Lake City, Utah 84105

Filed Jul. 26, 1984, Ser. No. 634,425

Int. Cl.³ F02M *7/12*; **F02B** *77/08*

U.S. Cl. 123—198 D **7 Claims**



1. In combination: a side-draft demand-type carburetor having a venturi throat in part defined by a raised bridge and movable air valve disposed thereover and having an undersurface, a vacuum bowl slideably receiving said air valve as a piston and constructed to reflect intake manifold pressure behind said air valve, said air valve having a downwardly tapered fuel metering valve depending therefrom proximate said venturi throat, said bridge area being provided with a fuel jet receiving said fuel metering valve, whereby the cross-sectional spacing between said fuel metering valve and said fuel jet increases progressively as said fuel metering valve is progressively raised, said carburetor having air-intake and intake-manifold flanges on opposite sides of said venturi throat, said carburetor including a throttle-butterfly valve disposed between said venturi throat and said intake-manifold flange; a manual control; first means for selectively lifting said air valve; and second means intercoupling said manual control with said first means for translating movements of said manual control to

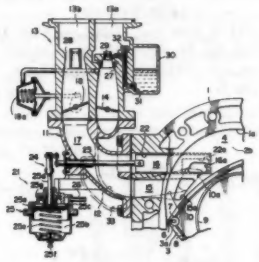
movement of said first means, whereby said first means selectively mechanically actuates said air valve independently of said vacuum bowl.

4,513,707

MULTIPLE PORT INTAKE MEANS FOR ROTARY PISTON ENGINES

Tomoo Tadokoro; Haruo Okimoto, and Ikuo Matsuda, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 21, 1983, Ser. No. 487,052
Claims priority, application Japan, Apr. 22, 1982, 57-68185
Int. Cl.[3] F02B *53/06*
U.S. Cl. 123—242 4 Claims



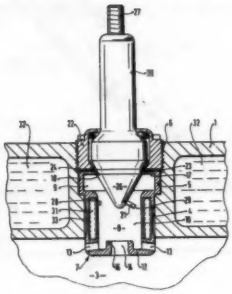
1. A rotary piston engine including a casing comprised of a rotor housing having a trochoidal inner wall and a pair of side housings secured to the opposite sides of the rotor housing to define a rotor cavity therein, a substantially polygonal rotor disposed in said rotor cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing to define working chambers of variable volumes to conduct intake, compression, combustion, expansion and exhaust strokes, exhaust port means formed in said casing so as to open to said rotor cavity at the working chamber in the exhaust stroke, first intake port means formed in said casing so as to open to said rotor cavity at the working chamber in the intake stroke, second intake port means formed in said casing so as to open to said rotor cavity at the working chamber in the intake stroke and located so that it is disconnected from the same working chamber later than the first intake port means, control valve means provided in said second intake port means for opening the second intake port means in heavy load engine operation, third intake port means formed in said casing so as to open to said rotor cavity at the working chamber in the intake stroke and located so that it is disconnected from the same working chamber earlier than said first intake port means, primary intake passage means having primary throttle valve means and connected with said first intake port means, secondary intake passage means connected with said second and third intake port means and having second throttle valve means which is closed under light load.

4,513,708

METHOD FOR IGNITING LEAN FUEL-AIR MIXTURES AND AN APPARATUS TO PERFORM THE METHOD

Reinhard Latsch, Vahingen; Hans Schlembach, Mühlacker, and Dieter Scherenberg, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 403,902, Jul. 30, 1982, Pat. No. 4,442,807, which is a continuation of Ser. No. 141,437, Apr. 17, 1980, abandoned. This application Dec. 21, 1983, Ser. No. 563,856
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916285
Int. Cl.[3] F02B *19/18*
U.S. Cl. 123—263 19 Claims



1. An apparatus for igniting a combustible mixture in a main combustion chamber of an internal combustion engine, wherein the apparatus comprises:

a substantially rotationally symmetrical ignition chamber wall formed by a circumferential wall having a first diameter section which is of lesser diameter than a second diameter section with the length of said chamber greater than the diameter, a front wall integral with said first diameter section and extending into said combustion chamber of said engine, a first, axially aligned, overflow conduit which penetrates said front wall, and a plurality of second overflow conduits which substantially discharge into said ignition chamber at a tangent with said first diameter section of said chamber along a diametrical plane,

an ignition device having an insulator, a first electrode supported by said insulator, a second electrode connected to ground and a spark gap located between said first and second electrodes,

characterized in that

the second overflow conduits, at the outermost end toward the combustion chamber of the ignition chamber, discharge at a tangent to the circumferential wall of said first diameter section in a plane radial to the longitudinal axis of the ignition chamber,

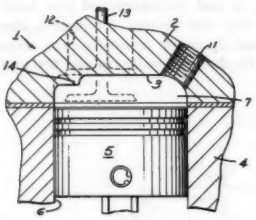
said insulator protrudes into an end of the ignition chamber axially through said second diameter section and facing said front wall,

one end of said electrode supported by said insulator, which electrode defines a spark gap path and terminates in a vicinity near the circumferential wall in a reference plane located transversely to the longitudinal axis of the ignition chamber, which plane divides the volume of the ignition chamber into a first partial volume, adjacent to the front wall, and a second partial volume, into which the insulator plunges, the second partial volume being at least equal to said first partial volume.

4,513,709
INTERNAL COMBUSTION ENGINE AND CYLINDER HEAD THEREFOR

Richard J. L. Stace, Southend-On-Sea, England, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/GB82/00065, § 371 Date Oct. 14, 1982, § 102(e) Date Oct. 14, 1982, PCT Pub. No. WO82/02924, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 26, 1982, Ser. No. 442,195
Claims priority, application United Kingdom, Feb. 27, 1981, 8106324
Int. Cl.³ F02B 31/00
U.S. Cl. 123—306 3 Claims

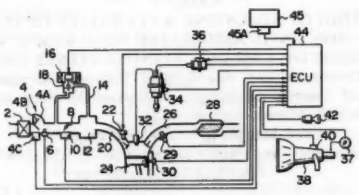


1. A cylinder head for an internal combustion engine having walls comprising a recess having an upper substantially planar wall and side walls for cooperating with a piston and cylinder in a cylinder block to define a combustion chamber, and inlet and outlet apertures for seating axially movable inlet and outlet valves, the walls of the recess around the inlet aperture having means axially extending below the planar wall to impart a swirling action to gases flowing from the inlet aperture into the chamber as the inlet valve reaches a partially open position, the means extending axially less than that of full axial movement of the inlet valve to eliminate the swirl imparted action to the gases when the inlet valve is fully open.

4,513,710
ENGINE IDLING ROTATIONAL SPEED CONTROL DEVICE

Nobuyuki Kobayashi; Hiroshi Ito, and Nobuhisa Ohkawa, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 11, 1982, Ser. No. 407,169
Claims priority, application Japan, Aug. 13, 1981, 56-126886
Int. Cl.³ F02D 9/02, 31/00
U.S. Cl. 123—339 6 Claims



1. An engine idling rotational speed control device comprising:

a throttle valve provided in a main intake passage and adapted to be substantially fully closed when an accelerator pedal is released;

a flow rate control valve provided in a bypass intake passage for controlling intake air quantity taken into a combustion chamber of an engine through said bypass intake passage;

a stepping motor for driving said flow rate control valve; and

an electronic control circuit means for:

controlling a step position of said stepping motor such that an engine rotational speed becomes within a target rotational speed range;

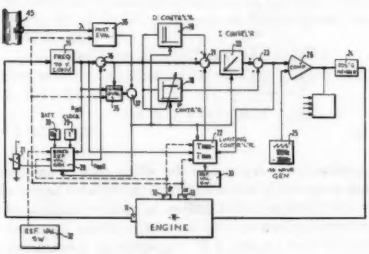
learning, whenever said engine rotational speed is within said target rotational speed range, an idle step number for the step position of said motor such that said idle step number coincides with a converted value, which value is obtained by cancelling an incremental step number for an idle up, required in accordance with a load on the engine and a coolant temperature, from a current step position of the stepping motor, said converted value being indicative of a step position converted by substituting a predetermined standard engine load and coolant temperature for the engine load and the coolant temperature which are used to control a current step position; and

determining a lower limit by subtracting a predetermined value from said idle step number, said lower limit being large enough to prevent full-close state of said intake air flow rate control valve, whereby said intake air flow rate control valve is prevented from being closed below said lower limit.

4,513,711
APPARATUS FOR REGULATING THE IDLING SPEED OF INTERNAL COMBUSTION ENGINES

Günter Braun, Freiberg; Alfred Kratt, Trossingen, and Rolf Schleicher, Leinfelden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,685
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235186
Int. Cl.³ F02D 11/10
U.S. Cl. 123—339 10 Claims



1. Apparatus for regulating the idling speed of an internal combustion engine of which the speed is controllable by a throttle valve in the intact duct of the engine, said apparatus including an electrically operable mechanical device (24) for determining the rate of air intake in the idling condition by setting a minimum-air-intake limit for the air intake control function performed by said throttle valve, and electrical comparison stage (16, 28) for comparison of actual engine speed with a reference desired speed value and having an output representative of said comparison, a controller stage (18, 19, 20) having components respectively of proportional, integral and differential (PID) behavior types and means for combining the outputs of said components, and in which at least one component control parameter (P, I or D) is of variable magnitude for control purposes, said controller stage being responsive to said output of said comparison stage and having its output connected for control of said mechanical device, said apparatus incorporating the improvement comprising:

first means for detecting engine speed fluctuations deviating upward and downward of said reference desired speed value with a speed deviation characteristic exceeding a

predetermined speed deviation characteristic and for providing an output signal when said fluctuations deviate both upward and downward of said reference speed value with a speed deviation characteristic exceeding said predetermined characteristic continue for a predetermined period of time, and

second means, responsive to said output signal of said first means for increasing the idling speed of said engine indirectly by reducing the magnitude of said at least one variable component control parameter of said controller stage.

4,513,712

APPARATUS FOR REGULATING THE IDLING RPM IN AN INTERNAL COMBUSTION ENGINE

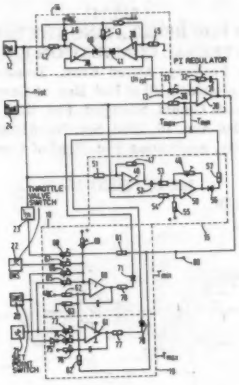
Hermann Gässler, Vaihingen/ENZ, and Wolfgang Kosak, Mölingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 417,936, Sep. 14, 1982, abandoned. This application May 31, 1984, Ser. No. 615,874

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149097

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—339 **8 Claims**



1. An apparatus for regulating the idling rpm of an internal combustion engine in a manner to prevent stallout below critically low idle rpms incurred during accessory loading of the engine, comprising sensor means for the actual rpm and the temperature of said engine, a PI regulator for processing the output signal of said actual rpm sensing means and a signal related to the output signal of said temperature sensing means, and a control circuit acting on said actual rpm signal for changing the actual rpm signal input to said PI regulator to thereby permit the amplified PI-component to be switched into two ranges by means of said control circuit.

4,513,713

METHOD OF CONTROLLING OPERATING AMOUNTS OF OPERATION CONTROL MEANS FOR AN INTERNAL COMBUSTION ENGINE

Takashi Koumura, Saitama, and Toyohei Nakajima, Shiki, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

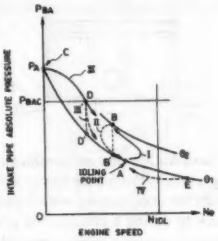
Filed Aug. 31, 1984, Ser. No. 646,684

Claims priority, application Japan, Sep. 6, 1983, 58-163789; Oct. 20, 1983, 58-196891

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—339 **11 Claims**

1. A method of electronically controlling an operating amount of an operation control means for controlling the operation of an internal combustion engine, comprising the steps of: (1) detecting a value of a first engine operating parameter indicative of loaded conditions of said engine; (2) detecting a value of a second engine operating parameter indicative of loaded conditions of said engine; (3) determining whether or not said engine is operating in a predetermined low load condition; (4) determining a desired operating amount of said operation control means in dependence on the detected value of said first engine operating parameter obtained at said step (1) when said engine is determined to be operating in said predetermined low load condition; (5) determining the desired operating amount of said operation control means in dependence on the detected value of said second engine operating parameter obtained at said step (2) when said engine is determined not to be operating in said predetermined low load condition; (6) determining first and second provisional desired operating amounts of said operation control means, respectively, in dependence on the detected values of said first and second engine



operating parameters, when it is determined that said engine has entered said predetermined low load condition from a condition other than said predetermined low load condititon; (7) comparing the determined first provisional desired operating amount with the determined second provisional desired operating amount; (8) determining the desired operating amount of said operation control means in dependence on the determined second provisional desired operating amount from the time it is determined that said engine has entered said predetermined low load condition to the time the determined second provisional desired operating amount becomes substantially equal to the determined first provisional desired operating amount, even while said engine is actually operating in said predetermined low load condition; and (9) controlling the operating amount of said operation control means on the basis of the desired operating amount determined at said step (4), (5) or (8).

4,513,714

METHOD OF ADJUSTING A PLURALITY OF FUEL INJECTION UNITS ASSOCIATED WITH RESPECTIVE CYLINDERS OF A MULTI-CYLINDER DIESEL ENGINE

Anton Dolenc, Vienna, and Leopold Rollenitz, Kirchstetten, both of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Jan. 28, 1983, Ser. No. 462,098

Claims priority, application Austria, Feb. 3, 1982, 393/82

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—357 **2 Claims**

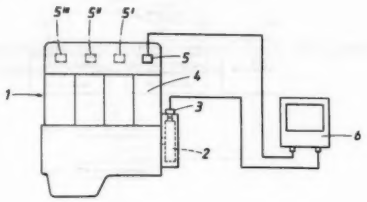
1. A method of adjusting a plurality of fuel injection units associated with respective cylinders of a multi-cylinder diesel engine having a crankshaft operatively connected to all said cylinders,

each of said fuel injection units comprising a fuel injection nozzle, a fuel injection pump connected to said nozzle and operable to discharge fuel therethrough, a housing accommodating said nozzle and said pump, drive means for driving said pump, a capacity control element for controlling the capacity of said pump, and a timing control ele-

ment for controlling the time at which said pump begins to discharge fuel through said nozzle,

the steps of connecting first sensor means to said engine for generating output signals representing the pressure in each of said cylinders, connecting second sensor means to said engine for generating output signals representing respective rotational positions of said crankshaft, and connecting, indicating means to said first and second sensor means for receiving the output signals thereof and for indicating for each of said cylinders a peak value of said pressure and the respective rotational position of said crankshaft at which said pressure begins to rise as a result of a combustion of the fuel,

wherein the improvement comprises



mounting each of said fuel injection units on, and operatively connected to, the associated cylinder of said engine,

operating said engine under idling conditions to effect the combustion of fuel in each of said cylinders and adjusting said capacity control element of each of said fuel injection units so that the pressure in each of said cylinders rises to the same peak value as a result of said combustion, and

subsequently operating said engine to effect a combustion of fuel in each of said cylinders and adjusting said timing control element of each of said fuel injection units so that said pressure in each of said cylinder begins to rise when said crankshaft is in a predetermined rotational position desired for the beginning of said combustion.

4,513,715

DISTRIBUTOR INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

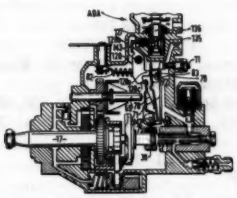
Wolfgang Braun, Ditzingen; Karl Konrath, Ludwigsburg, and Manfred Schwarz, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,609

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242108

Int. Cl.³ F02D 1/02

U.S. Cl. 123—383 **10 Claims**



1. A distributor injection pump for an internal combustion engine including injection valves in which fuel is furnished to the injection valves of said engine, said pump comprising a housing, a drive means and a distributor piston coupled to said drive means for rotational and reciprocal movement thereby, said distributor piston aspirating fuel during an intake phase from an interior chamber of said housing and during a compression phase sending said fuel on to said injection valves, an end of an injection interval being fixed by a regulating governor slide means displaceably disposed on said distributor piston and cooperating with a control bore in said distributor piston, a relative position of said slide means to said control bore in said piston being controlled by a starting lever which is pivotable about a pivot means adjustably disposed in said pump housing, said starting lever having an elongated lever arm displaceable in one direction about said pivot means by a governor sleeve of an adjuster means counter to a force of a starting spring, said adjuster means being responsive to engine rpm, said starting spring being supported on a tensioning lever supported on said pivot means in common with said starting lever, wherein upon the attainment of a predetermined idling rpm said governor sleeve displaces the starting lever into abutting relation to said tensioning lever whereby the starting spring is overridden and the starting lever with the tensioning lever resting firmly thereon directly controls a movement of the slide means while a regulating function of said slide means is assumed by an idling spring, wherein said governor sleeve operates counter to a force of said idling spring and, upon the idling rpm being exceeded, additionally operates counter to a force of a governor spring influenced by a set position of a gas pedal, said pump being provided with a transducer device, which determines an utmost position of the tensioning lever in the direction of a force of the governor spring and of the idling spring with the aid of a control member abutting said tensioning lever, said control member having an extension, which upon starting of said engine lifts said starting lever from said governor sleeve in the presence of predetermined engine and use-specific operating conditions, as long as said governor sleeve is at least approximately in its outset position corresponding to zero rmp.

4,513,716

IGNITION TIMING CONTROL SYSTEM WITH KNOCK CONTROL FOR INTERNAL COMBUSTION ENGINES

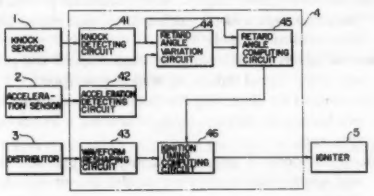
Hiroshi Haraguchi, Oobu; Ko Narita, and Toshiharu Iwata, both of Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 30, 1982, Ser. No. 445,543

Claims priority, application Japan, Dec. 2, 1981, 56-194824; Dec. 3, 1981, 56-195142

Int. Cl.³ F02P 5/04

U.S. Cl. 123—425 **18 Claims**



1. An ignition timing control system with knock control for internal combustion engines, comprising:

a knocking sensor for detecting the occurrence of knocking in an engine and producing signals indicative thereof;

an acceleration sensor for detecting an acceleration condition of said engine and producing signals indicative thereof;

a control unit, responsive to detection signals from said knocking sensor and said acceleration sensor, for retarding ignition timing of said engine by a given retard angle, said control unit determining the presence or absence of knocking in accordance with the signals from said knocking sensor and determining whether present knocking signals exceed a predetermined level thereby constituting heavy knocking, said control unit further determining the presence or absence of acceleration in accordance with

the signals from said acceleration sensor and increasing the amount of retard per each determined knocking whenever both heavy knocking and acceleration are determined, but maintaining said given retard angle if either determination has not been made in accordance with the results of said determinations, and said control unit generating a control signal corresponding to the amount of retard; and

ignition means for igniting said engine at an ignition timing corresponding to said control signal from said control unit.

4,513,717

IGNITION TIMING CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

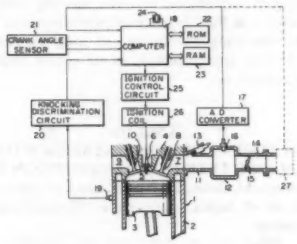
Tatsuo Kobayashi, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Tokota, Japan

Filed Mar. 9, 1983, Ser. No. 473,609

Claims priority, application Japan, Mar. 18, 1982, 57-041682

Int. Cl.³ F02P 5/04

U.S. Cl. 123—425 **10 Claims**



1. An ignition timing control device of an internal combustion engine having an intake passage and a spark plug, said device comprising:

first means for detecting the level of vacuum produced in the intake passage and producing an output signal indicating said level of vacuum;

second means for detecting the engine speed and producing an output signal indicating said engine speed;

third means for detecting the occurrence of a knocking and producing an output signal indicating a knocking intensity; and

electronic control means controlling the ignition timing of said spark plug in response to the output signals of said first means, said second means and said third means, and storing therein a data map which indicates an optimum ignition timing corresponding to said level of vacuum and said engine speed, said optimum ignition timing including a first optimum ignition timing which corresponds to said engine speed and said level of vacuum, detected by said first means, and including a second optimum ignition timing which corresponds to said engine speed and said level of vacuum produced in the intake passage when the engine is operating with wide open throttle, said electronic control means normally maintaining the ignition timing of said spark plug at said first optimum ignition timing, but retarding the ignition timing of said spark plug to the range of an ignition timing between said second optimum ignition timing and the midpoint of said first and said second optimum ignition timings when a knocking occurs.

4,513,718

APPARATUS FOR CONTROLLING IGNITION TIMING FOR INTERNAL COMBUSTION ENGINES

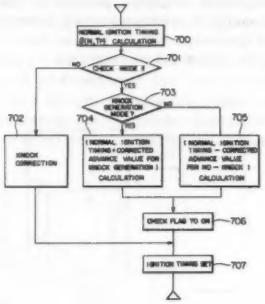
Toshio Ishii, Katsuta, and Noboru Sugiura, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,750

Claims priority, application Japan, Apr. 8, 1983, 58-60824

Int. Cl.³ F02P 5/14

U.S. Cl. 123—425 **12 Claims**



1. An ignition timing control apparatus for an internal combustion engine comprising:

a vibration sensor for detecting vibrations of said engine including knocking vibrations;

a knock detecting device for discriminating said knock vibrations by comparing the output of said vibration sensor with a predetermined level signal;

means for controlling ignition timing based on the output of said knock detecting device;

checking means for checking the detection sensitivity of said knock detecting device;

checking ignition timing generating means operable during the checking operation of said checking means for generating predetermined checking ignition timing, for at least one cylinder of said internal combustion engine, preset for the purpose of sensitivity check of said knock detecting device instead of generating a normal ignition timing obtained based on the output of said knock detecting device; and

means for correcting the sensitivity of said knock detecting device by checking by said checking means the reaction of said knock detecting device when ignition occurs by said checking ignition timing.

4,513,719

FUEL INJECTOR

Teruo Edo, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,889

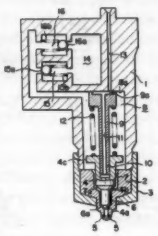
Claims priority, application Japan, Sep. 22, 1982, 57-142606[U]

Int. Cl.³ F02M 47/02

U.S. Cl. 123—447 **3 Claims**

1. A fuel injector for use in internal combustion engines including a fuel injector body, a nozzle means provided with injection orifices formed on the leading end thereof, a primary fuel accumulator chamber in the body, and a spring loaded or biased nozzle valve capable of opening inwardly disposed in the primary fuel accumulator chamber, wherein when said nozzle valve is moved to its open position by the pressure of the fuel under high pressure in the primary accumulator chamber, the fuel in the latter is injected through the injection

orifices into a combustion chamber of the engine, characterized by further comprising an auxiliary accumulator chamber



connected through first and second check valve means with said primary accumulator chamber.

4,513,720

FUEL INJECTION DEVICE FOR MOTOR VEHICLE

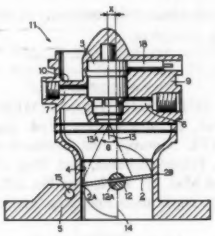
Keisou Takeda, Susono, and Toshiyuki Hirata, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 20, 1983, Ser. No. 515,668

Claims priority, application Japan, Dec. 14, 1982, 57-188884[U]

Int. Cl.³ F02M *61/14*

U.S. Cl. 123—470 **15 Claims**



1. A fuel injection apparatus for use in an internal, combustion engine, comprising:

a throttle body having a throttle bore therein;

a throttle valve means being rotatably responsive to an accelerator means, for controlling an amount of fuel-air mixture provided in said throttle bore, said throttle valve means having an upstream portion and a downstream portion, said upstream portion being located further upstream in the throttle bore with respect to the downstream portion upon opening of said throttle valve means; and

a fuel injection valve mounted upstream of said throttle valve means for injecting fuel primarily toward the downstream portion of the throttle valve means, said fuel being injected primarily toward said downstream portion by said fuel injection valve having its center-line oriented toward the downstream portion of said throttle valve means, wherein the fuel injected by said fuel injection valve assumes the shape of a hollow cone, and a distribution of the fuel-air mixture supplied to each cylinder of an engine is improved.

4,513,721

AIR-FUEL RATIO CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

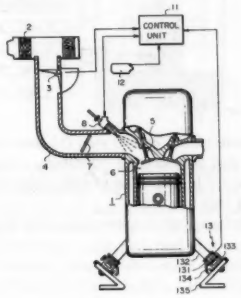
Toshikazu Ina, Aichi; Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi; Tokio Kohama, Nishio; Daisaku Sawada, and Takashi Shigematsu, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 9, 1982, Ser. No. 406,527

Claims priority, application Japan, Aug. 11, 1981, 56-124661; Aug. 31, 1981, 56-135581

Int. Cl.³ F02B *5/00, 3/04, 3/02;* F02D *5/00*

U.S. Cl. 123—478 **7 Claims**



1. An air-fuel ratio control device for an engine having an engine mount, comprising

torque detection means for outputting detection signals from a pressure sensor axially mounted on the end of an engine arm the other end of which is connected to said engine, said pressure sensor being compressed between a rubber mount cover covering a rubber mount mounted on said engine mount and a flange on said engine arm;

fuel-injector means for selectively injecting fuel into said engine; and

control means for controlling at least the fuel injector means to control the air-fuel ratio of said engine in accordance with said detection signals, said control means including means for producing a fuel injector control signal by processing said detection signals through a bandpass filter of 1 to several Hz frequency band, comparing said filtered detection signals with a desired air-fuel ratio control value and outputting a command signal to said fuel injector based on said comparison.

4,513,722

METHOD FOR CONTROLLING FUEL SUPPLY TO INTERNAL COMBUSTION ENGINES AT ACCELERATION IN COLD CONDITIONS

Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

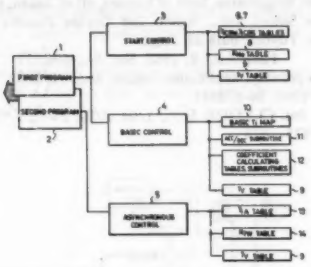
Division of Ser. No. 348,648, Feb. 12, 1982, Pat. No. 4,445,483. This application May 26, 1983, Ser. No. 498,272

Int. Cl.³ F02M *51/02*

U.S. Cl. 123—492 **9 Claims**

1. A method for electronically controlling fuel metering means for metering the quantity of fuel being supplied to an internal combustion engine, wherein a basic fuel quantity is set to a value corresponding to a condition in which the engine is operating, and said value of said basic fuel quantity thus set is corrected by means of correction coefficients including at least a first correction coefficient having a value dependent upon the temperature of the engine as well as the load of the engine, and a second correction coefficient, so as to supply a required quantity of fuel to the engine, the method comprising the steps of:

(a) setting the value of said second coefficient as a funciton of said first correction coefficient;
(b) determining whether or not the engine is operating in an accelerating condition;



(c) when it is determined in said step (b) that the engine is operating in said accelerating condition, correcting said basic fuel quantity by the value of said correction coefficient set in said step (a); and
(d) supplying the basic fuel quantity corrected in said step (c) to the engine.

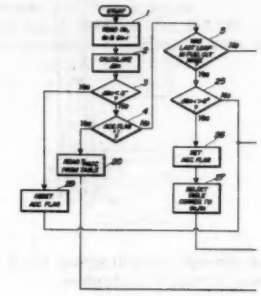
4,513,723

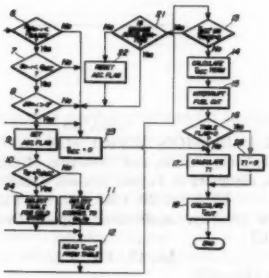
FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT ACCELERATION

Yoshikazu Ishikawa, Saitama, and Makoto Hashiguchi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,846
Claims priority, application Japan, Jun. 22, 1983, 58-112298
Int. Cl.³ F02D *5/02*
U.S. Cl. 123—492 **15 Claims**

1. A method of controlling the quantity of fuel being supplied to an internal combustion engine to values appropriate to operating conditions thereof in synchronism with generation of pulses of a predetermined control signal, the method comprising the steps of:
(a) setting beforehand a plurality of groups of predetermined correction values for increasing the quantity of fuel to be supplied to said engine at acceleration thereof, said predetermined correction values being functions of at least two operating parameters of said engine;
(b) determining whether or not said engine is operating in a predetermined accelerating condition;
(c) when it is determined for the first time that said engine is operating in said predetermined accelerating condition, detecting values of said at least two operating parameters upon the same determination being obtained;
(d) selecting one of said groups of predetermined correction values which corresponds to the detected values of said at least two operating parameters; and
(e) successively applying different ones of said predetermined correction values of said selected one group for correction of the quantity of fuel being supplied to said engine, with passage of time after said determination that said engine is operating in said predetermined accelerating condition is obtained for the first time and as long as said





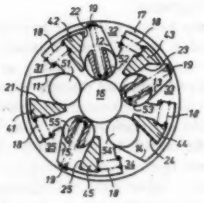
engine is determined to be operating in said predetermined accelerating condition.

4,513,724

FUEL INJECTION TIMER

Ewald Kamleitner, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,440
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109655
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—500 **5 Claims**



1. A fuel injection timer for an internal combustion engine, the timer being adapted to cause a relative rotation between a shaft of a fuel injection pump and a drive shaft connected to the internal combustion engine as a function of a rotational speed of the internal combustion enine, the timer comprising a plurality of first track means adapted to be connected to the drive shaft, a plurality of second track means adapted to be

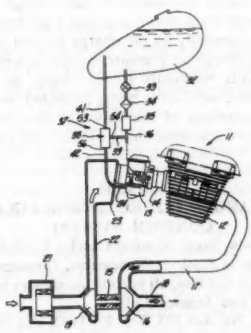
connected to the shaft of the fuel injection pump, the first and second track means being disposed in opposed pairs, oscillating means arranged between each pair of track means for transmitting drive torque for the fuel injection pump, the oscillating means being adapted to be displaced from a radially inner end position at a low rotational speed of the engine to a radially outer end position at a maximum rotational speed of the engine under an influence of centrifugal forces and spring forces, each pair of track means having a predetermined slope pattern for defining a displacement path for the oscillating means and for effecting relative rotation between the shaft of the injection pump and the drive shaft, the slope pattern of at least some of the opposed pairs of track means being nonuniform and including at least one segment having a slope pattern for enabling an automatic self-locking between the at least some pairs of opposed track means and the associated oscillating means, each at least one segment of the at least some pairs of opposed track means being associated with different rotational angles of the drive shaft and shaft of the fuel injection pump at which one of high torque peaks and oscillation caused by resonance occur, one of the track means of the at least some pairs of opposed track means including a plurality of segments having a slope pattern for enabling the automatic self-locking, at least one further segment having an extremely steep slope pattern disposed between the segments having a slope pattern for enabling the automatic self-locking, said at least some pairs of the opposed track means including at least two pairs of opposed track means arranged so as to effect an automatic self-locking between the drive shaft and shaft of the injection pump over an entire adjustment range of the injection timer.

4,513,725

DEVICE FOR SUPPLYING FUEL TO A PRESSURE CARBURETOR

Shunji Minami, Fukuroi, and Hiroshi Kimura, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 28, 1981, Ser. No. 297,320
Claims priority, application Japan, Aug. 29, 1980, 55-119559
Int. Cl.³ F02M *5/00*
U.S. Cl. 123—511 **6 Claims**



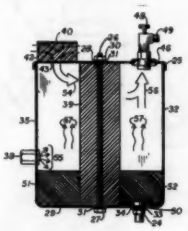
1. In a fuel feed and induction system for an internal combustion engine comprising a charge forming device having a fuel bowl, a float controlled valve for controlling the level of fuel in said fuel bowl, and a fuel discharge circuit fed by said fuel bowl, and a fuel pump for delivering fuel to said fuel bowl, the improvement comprising means for controlling the pressure at which said fuel pump delivers fuel to said fuel bowl in relation to the pressure above the fuel in said fuel bowl for maintaining a predetermined pressure differential between the delivery pressure and the pressure in the fuel bowl.

4,513,726

FUEL SAVING SYSTEM FOR A GASOLINE ENGINE

Richard Webb, Pratville, Calif., assignor to Misty Vapor, Inc., Orangevale, Calif.

Filed Apr. 6, 1984, Ser. No. 597,400
Int. Cl.³ F02M *17/00*
U.S. Cl. 123—523 **9 Claims**



1. In a fuel system for a vehicle having a carburetor, a gas tank fluidly coupled to the carburetor and a fuel pump disposed between the tank and carburetor for controlling the flow of fuel to the carburetor, and fuel vaporizing means in said system for delivering vaporized fuel to the combustion chambers of said vehicle, the improvement which comprises:

said vaporizing means including a vaporizing chamber having a top wall and a bottom wall and side walls and a fluid conduit coupling said chamber to a fluid conduit interconnecting said fuel pump to said carburetor:

an air inlet at the top of said chamber opening into the interior of said chamber;

a valve-controlled fluid conduit at the top of said chamber spaced from said air inlet communicating the interior of the top of said chamber with said carburetor;

a plate disposed underneath said carburetor in fluid communication both with the interior of said carburetor, said plate also being in fluid communication with said combustion chambers;

a valve controlled drain line fluidly coupled to a drain hole at the bottom of said vaporizing chamber and to a fluid conduit fluidly coupling said fuel pump to said gas tank;

first porous means disposed in said vaporizing chamber extending from the bottom to the top thereof;

second porous means disposed at the bottom of said vaporizing chamber; and a valve controlled fuel mist spray inlet in fluid communication with said fluid conduit interconnecting said fuel pump to said carburetor opening into the interior of said vaporizing chamber below the air inlet and above said second porous means adapted to spray fuel in a mist onto said first porous means whereby vapors are adapted to be created when air enters into said vaporizing chamber and mixes with said mist, said vapors being adapted to flow upwardly in said vaporizing chamber and exit out through said valve-controlled fluid conduit to said plate under carburetor.

4,513,727

PROCESS FOR CONTROLLING SECONDARY GAS FUEL TO NORMALLY LIQUID FUELED I.C. ENGINE

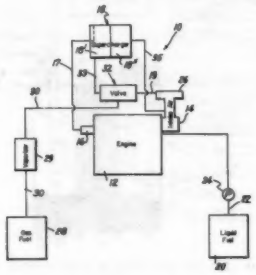
Thomas Lagano, Juno Beach, and William H. Batchelor, Jensen Beach, both of Fla., assignors to Propane Carburetion Systems, Inc., Stuart, Fla.

Division of Ser. No. 397,168, Jul. 12, 1982, Pat. No. 4,440,137.
This application Nov. 23, 1983, Ser. No. 554,624
Int. Cl.³ F02M *21/07*
U.S. Cl. 123—525 **3 Claims**

1. A process for controlling the supply of gaseous secondary fuel to the intake air stream of an internal combustion engine that normally is supplied with a liquid primary fuel under the control of an engine speed controller comprising:

(a) supplying gaseous secondary fuel to the engine air intake

stream in accordance with a desired air to secondary fuel ratio during normal engine operation by using a moveable air flow responsive member in the direct path of the engine air intake stream to control the position of a moveable gas valve element in a gas fuel supply system; and,



(b) effecting positive closure of the gas valve element when the engine speed controller is at or approaches its idle or off position without effecting movement of the air flow responsive member, so the air flow responsive member is movable by response to intake air flow even when the gas valve is closed.

4,513,728

AIR/FUEL INDUCTION SYSTEM FOR SPARK IGNITION INTERNAL COMBUSTION ENGINES, AND ELECTROMAGNETIC VALVES

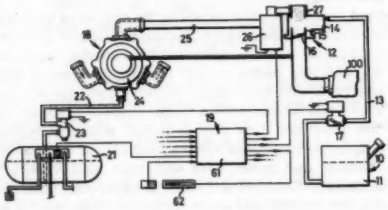
Thomas J. Ullman, Cranfield; Colin F. Shadbolt, Leighton Buzzard; Brian C. Pagdin; David J. Marriage, both of Dunstable; Peter J. Clarke, Leighton Buzzard, and Ian J. Sheppard, St. Albans, all of England, assignors to Solex (U.K.) Limited, Middlesex, England

Filed Dec. 14, 1982, Ser. No. 449,786

Claims priority, application United Kingdom, Jan. 15, 1982, 8201104

Int. Cl.³ F02M *13/06*

U.S. Cl. 123—527 **17 Claims**



1. An air/fuel induction system for a spark ignition internal combustion engine, the system comprising an air/fuel induction passage with a driver-operable throttle valve therein, and a fuel system by which gaseous fuel is presented to a location in the induction passage; the fuel system comprising pressure regulating means operable to regulate the pressure of the gaseous fuel and conduit means by which the gaseous fuel is conveyed to said location, the pressure regulating means being adapted to respond to changes in a depression which is established downstream of the throttle valve by operation of the engine and to effect a consequent change in the regulated pressure of the gaseous fuel such that it varies in the opposite sense to variations of said depression; wherein the pressure regulating means are adapted to maintain the gaseous fuel at a pressure higher than that established at said location by operation of the engine and comprise a single movable wall which separates two chambers, one of the two chambers containing gaseous fuel at the regulated pressure and the other chamber being in communication with said induction passage downstream of said throttle valve, there being an injection valve in said conduit means operable to effect injection of metered quantities of said gaseous fuel whereby said gaseous fuel is presented to said location, and control means responsive to certain engine operating conditions and operable to control operation of said injection valve in accordance with those conditions such that the volumetric flow rate at which said gaseous fuel is injected is matched to the operational requirements of the engine.

4,513,729

SYSTEM FOR SUPPLYING COMBUSTION AIR TO A SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH CHARGE AIR COOLING

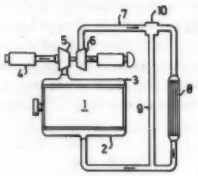
Sören Udd, Nödinge, Sweden, assignor to AB Volvo, Göteborg, Sweden

Filed Nov. 23, 1982, Ser. No. 444,036

Claims priority, application Sweden, Dec. 1, 1981, 8107168

Int. Cl.³ F02B *29/04*

U.S. Cl. 123—563 **6 Claims**



1. System for supplying combustion air to the cylinders in a combustion engine for vehicles, comprising a compressor for elevating the pressure of the air supplied to the air intake of the cylinders, a charge air cooler for cooling the charge air from the compressor, and a valve which permits the supply of charge air from the compressor past the charge air cooler directly to the engine air intake, characterized in that the valve is a two-way valve controlled by the charge air pressure, which at a charge air pressure less than a predetermined pressure conducts essentially all the charge air past the charge air cooler and at a charge air pressure exceeding a predetermined pressure conducts essentially all the charge air through the charge air cooler, said valve being provided with means for delaying the switching of the valve, in any position of the valve, when there is a rapid change in the charge air pressure.

4,513,730

SUPERCHARGED DIESEL ENGINE AIR INFLOW CONTROL SYSTEM

Robert L. Cholvin, Santa Monica; Charles E. McInerney, Rolling Hills Estates; James N. Nancarrow, Torrance, and Jack L. Gantz, Marina Del Rey, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 424,205, Sep. 27, 1982, Pat. No. 4,489,702. This application Apr. 9, 1984, Ser. No. 598,144

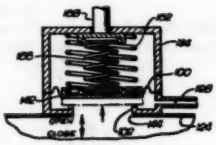
Int. Cl.³ F02D *23/02*

U.S. Cl. 123—564 **2 Claims**

1. An air inflow control system for a diesel engine system including a supercharging device for supplying air under pressure to an engine, an air inflow conduit coupled between the discharge side of the supercharging device and the intake side of the engine, and a fuel control rack for selectively controlling the flow of fuel to the engine, comprising:

a relief valve movable to open and close a relief port formed in the air inflow conduit to selectively divert a portion of the air flow from the engine; and

a controller including means for movably supporting said relief valve for movement relative to said relief port in response to the pressure of air within the air inflow conduit wherein said air pressure is indicative of engine air inflow, a first spring for biasing said relief valve with a



predetermined force toward a position closing said relief port, a slide block coupled to the fuel control rack for movement in response thereto, and a second spring reacting between said slide block and said relief valve to adjustably bias said relief valve toward a position closing said relief port.

4,513,731

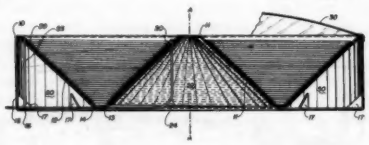
SOLAR HEAT COLLECTOR

Willis R. Campbell, R.D. #3, Box 58, Ephrata, Pa. 17522

Filed Sep. 30, 1982, Ser. No. 429,229

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—432 **20 Claims**



1. A solar collector comprising:

a frame defining an opening having a first diameter;

a downwardly converging frusto-conical wall portion of smaller diameter than said first diameter positioned within said frame and attached thereto;

an upwardly converging frusto-conical wall portion of smaller diameter than the minimum diameter of the downwardly converging frusto-conical wall portion positioned within said frame and within the downwardly converging frusto-conical wall portion and attached thereto;

fluid conduit means lying in parallel displacement on the downwardly and upwardly converging wall portions, said fluid conduit means being provided with inlet and outlet means to permit the flow of fluid into and out of said fluid conduit means, said fluid conduit means circulating fluid along a first spiral path disposed on said downwardly converging wall portion and a second spiral path disposed on said upwardly converging wall portion, said fluid conduit means being provided with a light absorbing surface to permit fluid to be heated by sunlight striking said fluid conduit means, said first and second spiral paths being interconnected;

circulating means for circulating fluid along a circulation path through said fluid conduit means, said circulation path including both said first and second spiral paths; and

cover means fixed to said frame for covering said fluid conduit means yet permitting the passage of sunlight thereto.

4,513,732

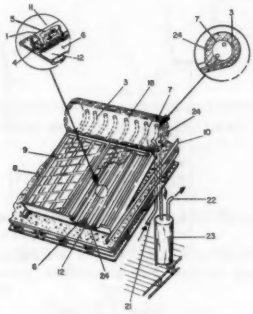
PASSIVE INTEGRAL SOLAR HEAT COLLECTOR SYSTEM

Karl T. Feldman, Jr., 1704 Stanford Dr., N.E., Albuquerque, N. Mex. 87106

Continuation-in-part of Ser. No. 298,085, Nov. 10, 1981, abandoned. This application Oct. 19, 1983, Ser. No. 543,243

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—433 **2 Claims**



1. A passive solar heating apparatus having at least one heat pipe with a first and a second end, with the first end serving as the heat absorber section located in a solar heat collector to absorb solar energy as heat and transfer it into the second end that serves as the heat removal section where an integral heat removal and storage means is attached to absorb and store the solar heat, wherein the passive solar heating apparatus comprises

a. a collector with at least one transparent cover on the top surface, thermal insulation on the bottom and edges, and a structural frame to hold the collector together, said structural frame comprising a rectangular box;

b. an absorber comprised of at least one heat pipe having sealed first and second ends, made from a hollow material capable of serving as a hermetically sealed vessel and having therein a volatile liquid that transfers heat by evaporation in the heated first end, said first end being located inside the collector to absorb solar heat, and condensation in the second end located outside of the collector where heat is removed, said absorber being tilted with the evaporator below the condenser so that condensate liquid will flow from the condenser to the evaporator by gravity and by surface tension forces and thereby provide one-directional heat transfer into the condenser but not out of it, said absorber being coated with an effective solar radiation absorber surface, each of said at least one heat pipe having externally an integrally extruded metal fin and internally an axially grooved wick lining on the inside wall to distribute the liquid to wet all of the internal surface for enhanced evaporation and condensation;

c. an integral heat removal and storage means to remove and store heat, said internal heat removal and storage means having an insulated tank of liquid with the bottom thereof closely mechanically contacting with low thermal resistance the condenser on the second end of each of said at least one heat pipe, said insulated tank having a cold liquid inlet and a hot liquid outlet pipe so that the solar heat removed and stored may be transferred to liquid flowing into and out of said insulated tank, said insulated tank further having a cover over the insulation with the surface of the cover adjacent to the collector being a refective surface to reflect additional solar radiation onto the collector; and

d. a support structure attached to said collector and to said

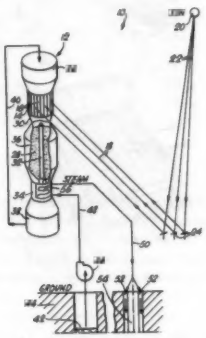
integral heat removal and storage means to hold them together and in proper orientation to receive solar energy and to resist environmental effects.

4,513,733

OIL FIELD STEAM PRODUCTION AND USE

Minel J. Braun, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 12, 1982, Ser. No. 441,322
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—435 **14 Claims**



1. A method of heating oil in a well comprising:

a. flowing heated refractory particles through a steam generator;

b. pumping untreated well water the source of which is the ground from out of the well through a first cavity in the ground and through tube means in the steam generator in heat exchange relation with the heated refractory particles to heat the untreated well water to generate steam; and

c. flowing the steam into the well through a second cavity in the ground to heat oil in the well.

8. Apparatus for heating oil in a well comprising solar receiver means for flowing refractory particles in heat exchange relation with solar radiation energy to heat the refractory particles, means for pumping untreated well water the source of which is the ground from out of a well through a first cavity in the ground, steam generating means for flowing untreated well water pumped from the well through tube means in heat exchange relation with the heated refractory particles to generate steam, and means for routing the steam into the well through a second cavity in the ground to heat oil in the well.

4,513,734

HIGH EFFICIENCY FLAT PLATE SOLAR ENERGY COLLECTOR

Robert F. Butler, 18805 Orange Ave., Sonoma, Calif. 95476

Filed Aug. 10, 1983, Ser. No. 521,923
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—439 **5 Claims**

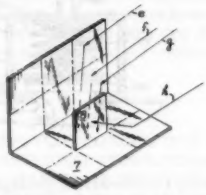
1. A high efficiency solar energy collector, which comprises:

(a) a flat plate collector element having two faces for the collection of solar radiation and so oriented that the sun's rays impinge thereon at oblique incident angles;

(b) a first, flat plate reflector element disposed substantially at right angles to and reflecting upon a first face of the collector element adjacent the base thereof, the dimensions of the reflector element being sufficient to reflect the maximum amount of solar radiation incident on the plane thereof onto the first face of the collector element;

(c) a second, flat plate reflector element disposed substantially at right angles to and reflecting upon the opposite face of the collector element adjacent the base thereof, the dimensions of the second reflector element being sufficient to reflect the maximum amount of solar radiation incident on the plane thereof on said opposite face of the collector element; and

(d) a third, flat plate reflector element disposed substantially parallel to the collector element and spaced therefrom by



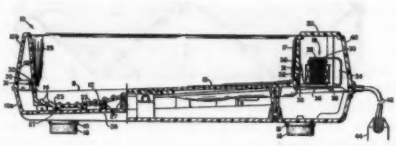
a distance at least equal to the length of the second reflector element disposed substantially perpendicular to the collector element, the dimensions of the third reflector element being sufficient to reflect the maximum amount of solar radiation incident on the plane thereof, either directly or indirectly by reflection on said second reflector element, onto said opposite face of the collector element.

4,513,735

APPARATUS FOR TREATING THE FEET

Belvin F. Friedson, Miami; Arnold Thaler, Plantation, and Ivan Saud, Miami, all of Fla., assignors to Windmere Corporation, Hialeah, Fla.

Division of Ser. No. 335,360, Dec. 29, 1981, Pat. No. 4,429,687.
This application Nov. 8, 1983, Ser. No. 549,726
Int. Cl.³ A61H *21/00*
U.S. Cl. 128—24.2 **6 Claims**



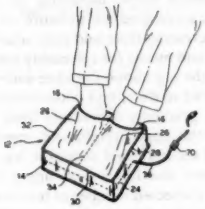
1. Apparatus for providing a heated massage treatment for the feet, said apparatus comprising: a casing including a tub for receiving and containing liquid for encircling the feet in such liquid, said tub having a floor with upwardly extending side walls; a foot receiving station located in said floor; and first and second heating means for providing heat to liquid within said tub for heating such liquid and maintaining the temperature of such liquid relatively uniform from top to bottom of the liquid and for providing heat directly to said foot receiving station; said first heating means being located below and adjacent to said floor, said first heating means including a rope heating element which is mounted in a channel located in the lower surface of the floor beneath each of the foot receiving stations, said rope heating elements extending the length and width of said foot receiving stations in a series of U-shaped or serpentine curves; said second heating means being mounted within said casing at a distance above the floor corresponding to the approximate upper level to which said tub is to be filled with liquid, said second heating means including a rope heating element mounted in brackets which extend inwardly from the exterior side walls; said casing further including a bottom member having means for locking the rope heating elements in position directly adjacent the floor of the tub; and, vibrator means mounted on the casing for transmitting vibrations to said casing, said vibrator including a C-shaped vibrator plate having upper and lower end portions, a power transformer mounted at the upper end portion of said plate with the lower

end portion of said plate being mounted on the casing at the level of the floor, and said vibrator being aligned with the longitudinal axis of said casing.

4,513,736
CUSHIONED MASSAGER

Robert J. Thurber, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Continuation of Ser. No. 163,790, Jun. 27, 1980, abandoned.
This application Jun. 24, 1983, Ser. No. 507,942
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—41 **10 Claims**



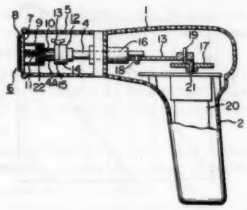
1. Apparatus for massaging at least one human foot while said foot rests passively on said apparatus, said apparatus comprising powered vibration means, a cushion containing a stuffing material and enclosing said powered vibration means for vibrating said cushion and foot while said foot remains passively resting directly on said cushion, a cover for said cushion, said cover having a soft, limp, pliable and resilient material with an overlying member formed of said cover material and secured around at least part of the perimeter of said cover, said overlying member forming at least one pouch secured to the top of said cushion, the upper portion of the cover integrally attached to and forming the bottom part of said pouch, whereby said cover and pouch are made of said soft, limp and pliable and resilient material, and are shaped and proportioned to loosely receive and surround a major portion of a human foot inserted therein substantially independent of the posture of the body of the human whose foot is in the pouch, said pouch being limp and collapsible so that a body part may also rest on top of the cushion without being inserted into the pouch, said powered means enclosed within said cushion vibrating both said cushion cover and said pouch cloth when power is applied thereto whereby the upper part of the foot is lightly rubbed by the overlying member formed by the soft, limp and pliable and resilient pouch material.

4,513,737
BEAUTY TREATMENT DEVICE

Kenichi Mabuchi, c/o Mabuchi Motor Co., Ltd. 14–11, Tateishi 3-chome, Katsushika-Ku, Tokyo, Japan, assignor to Kenichi Mabuchi, Japan

Filed Dec. 22, 1980, Ser. No. 219,360
Claims priority, application Japan, Dec. 29, 1979, 54-171725; Mar. 10, 1980, 55-30712[U]
Int. Cl.³ A61H *7/00*
U.S. Cl. 128—52 **2 Claims**

1. A beauty treatment device for treating a person's body, comprising a housing, an actuator mounted in said housing for sliding to and fro oscillating movement, drive means connected to said actuator to oscillate it, a patter member carried by said actuator and movable therewith, resilient means associated with said patter member and said actuator permitting a resilient give of said patter after contact with the body, a connecting mechanism between said actuator and said patter member permitting separation of said actuator from said patter member, push button means associated with said connecting mechanism for connecting and disconnecting said patter member and said actuator, said push button means including a pawl groove provided on said patter member and a connecting pawl fixed to said actuator and being engageable and disengageable

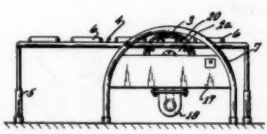


with said pawl groove and a push button movably mounted in said housing being movable to shift said pawl.

4,513,738
MASSAGE UNIT

Carl O. Niessen, Neckarsulmer Str. 4, 1000 Berlin 46, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,468
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135778
Int. Cl.³ A61H *15/00*
U.S. Cl. 128—57 **6 Claims**



1. Massage unit comprising:
a stationary frame;
a drum rotatively mounted in the frame and having a peripheral mounting space;
a plurality of passively freely rotatable massage rollers journaled in said mounting space and being annularly arranged in the drum and defining in parts a periphery of the drum;
means on the frame connected for driving the drum, for rotation about its axis;
a height adjustable bed, further positionable in relation to the frame and the drum by shifting in a direction transverse to the axis of the drum and having a surface on which a person may lie, said surface including means for allowing a portion of the drum to extend above said surface for massagingly engaging the person lying on the bed's surface; and
fastening means for releasably connecting the bed to the frame and in different relative longitudinal positions in relation to each other, attained by shifting in a transverse direction.

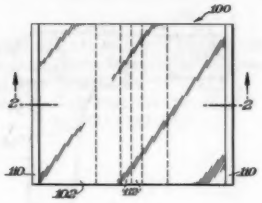
4,513,739
WOUND DRESSING

Owen L. Johns, Clearwater, Fla., assignor to Howmedica, Inc., New York, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,770
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **17 Claims**

1. An external wound dressing, which comprises:
(a) a first layer of backing sheet material having biocompatible adhesive coating on a first face thereof;
(b) a second layer of protective sheet material covering said first layer in releasible contact with said adhesive, said

second layer having means for separation in one or more sections from said first layer; and



(c) release-retarding means along one edge or a pair of opposed edges of said dressing to require a greater force to separate said layers at said edges than at the remainder of the contacting area.

4,513,740

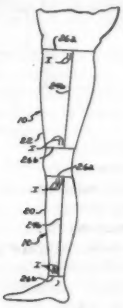
THERAPEUTIC STOCKING AND METHOD OF PLACEMENT

Betsy C. Westlake, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 391,195, Jun. 23, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,489

Int. Cl.[3] **A61F** *13/08*

U.S. Cl. 128—165 **8 Claims**



1. A therapeutic stocking, comprising:

a first circumferential panel segment for placement on the leg below the knee, said first panel having a pair of substantially straight opposed side edges and a pair of opposed end edges connecting the side edges, said first panel having a sufficient width between said side edges to encircle the leg below the knee in overlapping relationship, said first panel having a sufficient length between said end edges to extend from the ankle to a point slightly below the knee, said first panel segment comprising a knitted fabric including an elastomeric yarn which exerts a compressive pressure on the wearer's leg gradually decreasing from the ankle to said point below the knee, and means for releasably securing the first panel about the leg below the knee such that said first panel is assured to exert said compressive pressure on the wearer's leg, gradually decreasing from the ankle to said point below the knee, said means for releasably securing said first panel about the leg including indicia means adjacent the lower and upper ends thereof for representing a selected number of possible circumferential measurements of a wearer's leg at the ankle and an area just below the knee, whereby, after a determination of the circumference of a selected wearer's ankle and at an area just below the knee, said first panel may be placed about the lower leg with the side edges overlapped to match the circumference of the wearer's leg in the region of said indicia, thus to assure said compressive pressure is properly applied to the wearer's lower leg; and

a second circumferential panel segment for placement on the leg above the knee, said second panel having a pair of substantially straight opposed side edges and a pair of opposed end edges connecting the side edges, said second panel having a sufficient width between said side edges to encircle the leg above the knee in overlapping relationship, said second panel having a sufficient length between said end edges to extend from a point slightly above the knee to the upper thigh, said second panel segment comprising a knitted fabric including an elastomeric yarn which exerts a compressive pressure on the wearer's leg gradually decreasing from said point above the knee to the upper thigh, and means for releasably securing the second panel about the leg above the knee such that said second panel is assured to exert said compressive pressure on the wearer's leg, gradually decreasing from said point above the knee to the upper thigh, said means for releasably securing said second panel about the leg including indicia means adjacent the lower and upper ends thereof for representing a selected number of possible circumferential measurements of a wearer's leg at an area just above the knee and about the upper thigh, whereby said second panel may be placed about the upper leg with the side edges overlapped to match the circumference of the wearer's leg in the region of the indicia, thus to assure said compressive pressure is properly applied to the wearer's upper leg.

4,513,741

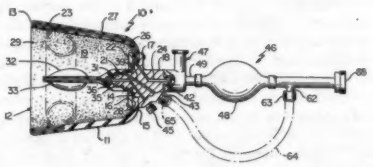
APPARATUS ADAPTABLE FOR TREATING ANIMALS

Roy C. Demi, 736 Melvin Dr., Greensburg, Pa. 15601

Filed Feb. 14, 1983, Ser. No. 466,070

Int. Cl.[3] **A61M** *16/00*

U.S. Cl. 128—205.25 **20 Claims**



1. Apparatus adaptable for treating animals comprising:

muzzle means adapted to fit around the snout of an animal and formed of a flexible bag open at one end and having an aperture in the other end, plug means fitted in said aperture and having first, second and third bores therein;

an inflatable cuff having a first pressure chamber therein connected to and extending around said open end of said flexible bag;

a first passageway formed in said flexible bag interconnecting said first pressure chamber and said first bore in said plug means;

a mouthpiece attached to said plug means and extending into said flexible bag;

a muzzle pump and conduit means connecting said muzzle pump to said plug means and having a first passage communicating with said first bore in said plug means for pressuring said first closed chamber to inflate said inflatable cuff, said cuff and said mouthpiece cooperating to secure said muzzle means to said snout when said mouthpiece is inserted into said animal's mouth and said cuff is inflated;

said conduit means further including inlet and outlet passages communicating with said second and third bores in

said plug means said second and third bores communicating with the interior of said flexible bag; and

a respiratory valve positioned in each of said inlet and outlet passages, said respiratory valve in said inlet passage acting as an inhalation valve and said respiratory valve in said outlet passage acting as an exhalation valve through which said animal may breathe normally.

4,513,742
SAW BLADE WITH APERTURE

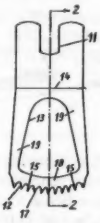
Richard E. Arnegger, Rietlirain, 8713 Uerikon, Switzerland

Filed Sep. 14, 1982, Ser. No. 418,070

Claims priority, application Switzerland, Oct. 13, 1981, 6523/81

Int. Cl.³ A61B *17/14*

U.S. Cl. 128—317 **10 Claims**



1. A thin plane saw blade for an oscillatory saw having at least a partial rotational action when in use for use in bone surgery, said saw blade having a distal end portion comprising: side faces parallel to a center plane of said blade; an outer edge located at the distal end portion of said blade; a row of teeth extending along a portion of said outer edge, the distance between said outer edge and the distal edge of the teeth defining a tooth height; at least one closed aperture which extends in the direction away from the row of teeth, the portion of the blade between the aperture and the row of teeth comprising a strip-like element, the distance between said aperture and said outer edge being uniform along the entire length of the strip and defining a strip height, said strip height being at most twice the tooth height; said saw blade aperture being of a form which is symmetrical with respect to a median plane arranged perpendicularly to said center plane, passing through the middle of the row of teeth and bisecting said aperture, the saw blade and its teeth being made of a single piece of hardened steel plate of which the closed aperture arrangement was worked out of the already hardened steel plate.

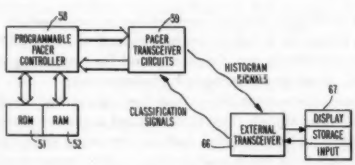
4,513,743
PHYSIOLOGICAL DEVICES SUCH AS PACEMAKERS AND METHOD FOR PROVIDING HISTOGRAM DATA

Gerrit W. van Arragon, Dieren; Kornelis A. Mensink, and Frederik H. M. Wittkampf, both of Brummen, all of Netherlands, assignors to Vitatron Medical B.V., Netherlands

Filed Nov. 12, 1982, Ser. No. 441,053

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—419 PG **34 Claims**



1. An implantable cardiac pacemaker, having means for determining the occurrence of selected cardiac events, means for delivering stimulus pulses, and means for measuring a predetermined parameter associated with each one of said selected cardiac events, further characterized by:

selecting means for selecting said selected cardiac events,

registering means for registering occurrences of said selected cardiac events,

classifying means for classifying each said registered event into respective classes of said parameter associated with said event in accordance with the measured value of said parameter,

means for accumulating counts of said registered events for each said class, thereby providing data of the distribution of said registered events; and

means for outputting signals representative of said accumulated counts to a location external of said implantable pacemaker.

4,513,744
SURGICAL COMPRESSION PLATE

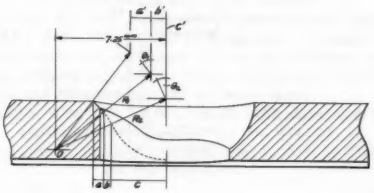
Kaj Klaue, Sierre, Switzerland, assignor to Synthes AG, Chur, Switzerland

Continuation-in-part of Ser. No. 358,389, Mar. 15, 1982,. This application Nov. 15, 1982, Ser. No. 441,633

Claims priority, application Switzerland, Mar. 16, 1981, 17731/81

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 D **9 Claims**



1. A compression plate for stabilizing a bone fracture or an osteotomy in compression osteosynthesis, said plate having an upper surface, a lower surface to be placed next to the bone, and at least one elongated hole, the walls of the hole being sloped downwardly, toward the lower surface, and inwardly, and an end wall of the hole having a camming portion curved convexly toward the center of the hole, said camming portion extending from the upper surface to a point adjacent the lower surface.

4,513,745
SURGICAL INSTRUMENTS AND METHODS PARTICULARLY ADAPTED FOR INTRA-OCULAR CUTTING AND THE LIKE

Selig P. Amoils, 4 Griswold Rd., Saxonwold, Johannesburg, South Africa

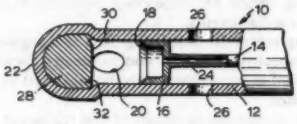
Continuation of Ser. No. 917,454, Jun. 21, 1978, abandoned. This application Nov. 7, 1980, Ser. No. 204,782

Int. Cl.³ A61B *17/32*

U.S. Cl. 128—305 **8 Claims**

1. In a surgical instrument for intra-ocular use, having in combination, a substantially cylindrical external hollow member, aperture means in said hollow member for receiving tissue-to-be-cut, annular cutting means disposed coaxially within the hollow member in close proximity to an inner wall thereof, the cutting means being adapted for reciprocatory motion within the hollow mmeber for effecting a guillotine cutting action on tissue drawn into said aperture means, and means cooperative with the cutting means for applying suction in the hollow member to draw the tissue-to-be-cut through the aper-

ture means into the path of the reciprocating cutting means, the improvement comprising anvil means within said hollow member, the anvil means having an anvil surface adjacent said aperture means for cooperation with the cutting means to



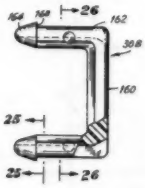
provide impact cutting of tissue drawn into said aperture means, the cutting means being adapted to effect said guillotine cutting action on tissue drawn into the aperture means prior to the impact cutting of the tissue against said anvil surface.

4,513,746

INSTRUMENT FOR APPLYING PLASTIC-LIKE SURGICAL FASTENING DEVICES

Ernie Aranyi, Shelton; Richard Ihasz, Milford; Roy D. Gravener, Bethany, and Hugh J. Tovey, Westport, all of Conn., assignors to United States Surgical Corp., Norwalk, Conn.

Filed Oct. 9, 1981, Ser. No. 310,412
Int. Cl.³ A61B *17/04*
U.S. Cl. 128—334 C **12 Claims**



1. A surgical fastening device for fastening body tissue, which comprises:

a unitary plastic-like retainer having a longitudinal extension; a hole extending longitudinally through the retainer and its longitudinal extension; the retainer being adapted to be positioned on the distal side of the tissue to be fastened; the longitudinal extension of the retainer being laterally expandable about the retainer hole; and

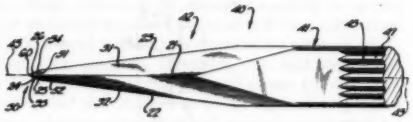
a unitary fastener, initially separate from the retainer, having a distally extending prong; the prong being sufficiently rigid to pass through a hole pierced in the tissue to be fastened without additional stiffening means; the fastener being adapted to be positioned on the proximal side of the tissue to be fastened; a laterally extending barb being provided on a lateral surface of the prong; the fastener being adapted to be moved distally so that the prong and its barb: (1) move distally through an opening pierced in the tissue to be fastened, and (2) then move distally into the retainer hole, with the barb urging the longitudinal extension of the retainer to expand laterally, until the barb extends distally of the longitudinal extension of the retainer and a proximal surface of the barb non-releasably engages a laterally extending, distal surface of the longitudinal extension of the retainer about the retainer hole to non-releasably hold the fastener and retainer together and further comprising: a channel extending longitudinally through the fastener and its prong and opening laterally outward from the prong; a pair of barbs on the prong on laterally opposite sides of the fastener channel: the longitudinal center line of the fastener channel; (1) being parallel to the longitudinal center line of the retainer hole and (2) extending within the retainer hole; and the fastener channel being adapted to allow a piercing member and the fastener to move longitudinally with respect to each other, such that: (1) the piercing member can move distally within and with respect to the fastener channel to pierce a hole through the tissue to be fastened, and (2) the fastener and its prong slide distally along the piercing member, such that the prong passes through the hole pierced in the tissue and into the retainer hole to non-releasably hold the fastener and retainer together.

4,513,747

HARD TISSUE SURGICAL NEEDLE

Daniel J. Smith, Englishtown, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Oct. 22, 1982, Ser. No. 436,221
Int. Cl.³ A61B *17/06*
U.S. Cl. 128—339 **23 Claims**



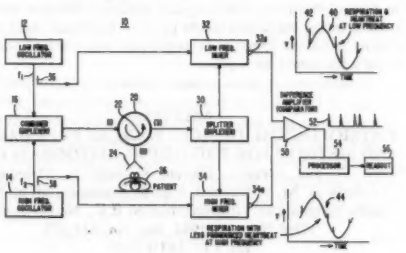
1. A surgical needle, comprising a body portion, a contiguous cutting portion which terminates near the tip of the needle and a tip portion, there being a plurality of planar surfaces forming cutting edges in said cutting portion, which cutting edges converge towards the tip of the needle, there being at least two additional planar surfaces intersecting in the tip portion of the needle forming additional cutting edges at the intersection between said additional planar surfaces and at intersections between said additional planar surfaces with selected ones of said plurality of planar surfaces.

4,513,748

DUAL FREQUENCY HEART RATE MONITOR UTILIZING DOPPLER RADAR

Markus Nowogrodzki, Sussex, and Daniel D. Mawhinney, Livingston, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 30, 1983, Ser. No. 527,768
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—653 **9 Claims**



1. A heart rate monitor comprising in combination:

first means for producing a first radio frequency (RF) signal at a relatively low frequency and for producing a second RF signal at a relatively high frequency;

second means coupled to said first means and adapted for radiating signals therefrom toward a patient whose heart rate is to be measured and for receiving doppler shifted signals back from said patient at the frequencies of said first and second RF signals;

third means for removing the respective RF frequencies from the returned signals leaving the doppler signal com-

ponents thereof, said doppler signal associated with both RF signals containing signal components of the same values corresponding to patient movement due to respiration, the doppler signal associated with the low RF frequency containing characteristics associated with patient movement due to heartbeat; and

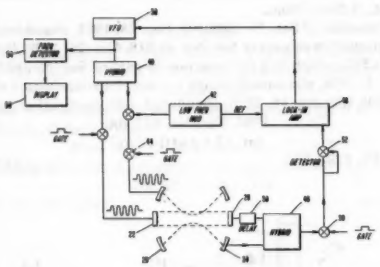
fourth means for combining the two doppler signals to remove the components thereof which are common to both signals and thereby leaving the component of signal which is associated with heartbeat, the number of heartbeats per unit time corresponding to heart rate.

4,513,749

THREE-DIMENSIONAL TEMPERATURE PROBE

Gordon S. Kino, Stanford; Simon D. Bennett, Palo Alto, and Didier Husson, Stanford, all of Calif., assignors to Board of Trustees of Leland Stanford University, Stanford, Calif.

Filed Nov. 18, 1982, Ser. No. 442,567
Int. Cl.³ A61B 5/00
U.S. Cl. 128—660 **22 Claims**



1. Apparatus for internally measuring variations in a body that affect the transmission of an energy wave through the body, comprising:

means for generating two coaxial energy beams, at least one of said beams being convergent and the other of said beams having generally the same cross-sectional area as said focused beam along most of the propagation path of said convergent beam and having a cross-sectional area that is greater than that of the convergent beam in the region of its convergence;

means for receiving said two beams after propagation through the region of the body being measured;

means for measuring changes in the relative phase angle between the received beams as an indication of variations in the body.

4,513,750

METHOD FOR THERMAL MONITORING SUBCUTANEOUS TISSUE

Joseph S. Heyman, Williamsburg, Va., and Gary H. Brandenburger, Bellevue, Wash., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

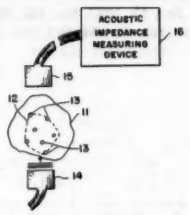
Filed Feb. 22, 1984, Ser. No. 582,492
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 **8 Claims**

1. A method for monitoring temperatures about a selected temperature in any medium especially in subcutaneous tissue in a living body comprising the steps of:

inserting beads of a material having a melting point approximately equal to said selected temperature, into said medium;

directing ultrasonic signals at said beads; and

receiving the ultrasonic signals reflected by said beads whereby the received signals contain information repre-



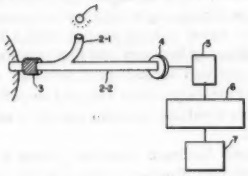
sentative of the acoustic impedance of said beads which is indicative of the temperature in said medium.

4,513,751

METHOD FOR MEASURING OXYGEN METABOLISM IN INTERNAL ORGAN OR TISSUE

Hiroshi Abe, No. 7-2, Fundo-cho, Nishinomiya-shi, Hyogo; Nobuhiro Sato, No. 1-5-11, Tachibana-cho, Toyonaka-shi, Osaka; Kimizo Ono, and Kazuo Hirano, both of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd.; Hiroshi Abe and Nobuhiro Sato, all of Osada, Japan

Continuation of Ser. No. 128,064, Mar. 7, 1980, abandoned. This application Mar. 11, 1983, Ser. No. 474,273
Claims priority, application Japan, Mar. 7, 1979, 54-27183
Int. Cl.³ A61B 5/02
U.S. Cl. 128—666 **7 Claims**



1. A method for measuring the metabolic rate for oxygen in an internal organ or in a tissue, comprising the steps of:

(a) interrupting the oxygen supply to a portion of said organ or tissue to be diagnosed by applying pressure at a predetermined point;

(b) directing light onto said portion;

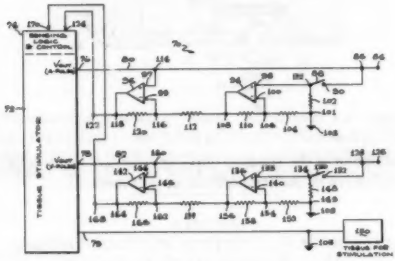
(c) sensing a first spectral characteristic of light reflected from said portion at at least one first wavelength, said first spectral characteristic varying in absorbance rapidly to a constant value following said step of interrupting said oxygen supply, and sensing a second spectral characteristic at at least one second wavelength of said reflected light, said second spectral characteristic continuing to change in absorbance after said first characteristic at said first wavelength has reached said absorbance constant value; and

(d) determining a rate of change of said second characteristic relative to said first characteristic after said first characteristic has reached said constant absorbance level said rate of change being indicative of the metabolic rate.

4,513,752
BIPOLAR SENSING SYSTEM

Robert R. Weyant, Claremont, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Jan. 17, 1983, Ser. No. 458,248
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—696 **9 Claims**



1. A sensing amplifier circuit for a tissue stimulator for supplying or attenuating far field signal voltage artifacts comprising:

(a) a first amplifier means having a first input terminal connected to a switch means connected to a second signal voltage output of a sensing means, a second input terminal connected to ground with a first resistance means disposed between said second input terminal and ground, and said first amplifier means provides a first amplifier signal voltage output;

(b) a first feedback network having a second resistance means therein disposed connected between said first amplifier signal voltage output and said second input terminal of said first amplifier;

(c) a third resistance means connected between said first input terminal and ground;

(d) a second amplifier means having a first input terminal connected to a first signal voltage output from said sensing means, a second input terminal connected to said first amplifier signal voltage output with a fourth resistance means disposed between said first amplifier signal voltage output and said second input terminal, and said second amplifier means provides a second amplifier signal voltage output for input into a sensing circuit of said tissue stimulator; and

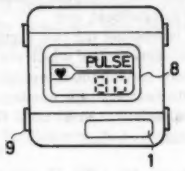
(e) a second feedback network having a fifth resistance means therein disposed connected between said second amplifier signal voltage output and said second input terminal of said second amplifier.

4,513,753
HEARTBEAT RATE INDICATOR

Junichi Tabata; Masahiro Torii; Hiroshi Oikawa; Minoru Sawada, and Yasuyuki Masui, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,324
Claims priority, application Japan, Nov. 17, 1981, 56-184247
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—706 **9 Claims**

1. A heartbeat rate indicator comprising: a depressible detection electrode; an amplifier connected to receive and amplify a signal from said detection electrode; a filter connected to said amplifier for passing part of the amplified signal output from said amplifier; an operation processing circuit connected to receive the filtered output signal from said filter for determining a heartbeat number; display means for indicating the heartbeat number; and switch means having a normally closed state for electrically connecting said detection electrode and one voltage potential of a power source to effect grounding of the detection electrode and being switchable to an open state upon

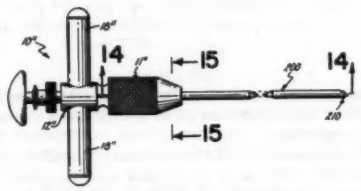


depression of said detection electrode to effect measurement of the heartbeat.

4,513,754
BIOPSY AND ASPIRATION UNIT WITH A REPLACEABLE CANNULA

Peter F. Lee, Edina, Minn., assignor to Southland Instruments, Inc., Edina, Minn.

Continuation of Ser. No. 306,305, Sep. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 88,818, Oct. 26, 1979, Pat. No. 4,314,565, which is a continuation-in-part of Ser. No. 883,263, Mar. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 706,130, Jul. 16, 1976, abandoned. This application Jun. 19, 1984, Ser. No. 622,100
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—753 **2 Claims**



1. An improved bone marrow biopsy needle unit, comprising:

holding means including a collet chuck and a head portion aligned coaxially so that a line running along the common axis defines a longitudinal axis of said holding means, a bore of circular cross section along said longitudinal axis through said head portion and said collet chuck, and handle means extending from said head portion generally at right angles to said longitudinal axis, said collet chuck comprising a plurality of arms with external threading thereon, adjacent arms being separated by a generally longitudinally extending slot, each arm terminating in a jaw portion, and a collar nut to threadedly engage and radially compress said arms, each arm having an interior surface, said interior surfaces defining a segmented ellipse when said arms are not compressed by said collar nut;

an elongated stylet, of predetermined length and gauge of generally uniform circular cross-section mounted in said aligned bores, said stylet having a distal end, a proximal end, and a cap portion at said proximal end;

engaging means on both said stylet and said head portion cooperating to releasably engage said stylet and said holding means;

and a replaceable cannula, of predetermined length and gauge, of uniform hollow cylindrical configuration throughout the major portion of its length, having an open distal end, defining a cutting edge, an open proximal end, and an external proximal end surface portion;

said replaceable cannula being of single-piece, stainless steel construction;

said proximal end portion having a generally elliptical cross-section and formed as a continuous extension of said cannula major portion, said proximal end portion being adapted to be releasably mounted in said collet chuck with a bore thereof being coaxially aligned with said bore of said holding means,

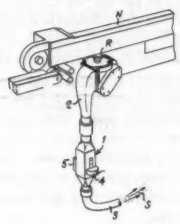
whereby said cannula is prevented from movement along or around said longitudinal axis by said proximal end portion being securely grasped by said arms of said collet chuck with said proximal end substantially abutting said collar nut and said collar nut compressing said interior surfaces of said arms of said collect chuck against said proximal end as said collar nut is threaded onto said collet chuck.

4,513,755

CONTROL DEVICE FOR REGULATING THE FEEDING OF CUT TOBACCO TO A CIGARETTE MAKING MACHINE

Bruno Baroni, San Giorgio di Piano, Italy, assignor to SASIB S.p.A., Bologna, Italy

Filed Apr. 23, 1982, Ser. No. 371,475
Claims priority, application Italy, Apr. 30, 1981, 12514 A/81
Int. Cl.³ A24C *5/18*
U.S. Cl. 131—84 C **13 Claims**



13. An automatic control device for use in combination with a continuous cigarette making machine, the machine including a tobacco distributor, a suction belt assembly for forming a uniform tobacco rod from cut tobacco dispensed by the tobacco distributor, a trimmer adjacent to the suction belt assembly for trimming excess tobacco from the uniform tobacco rod and a suction duct between the trimmer and the distributor for recirculating the trimmed excess tobacco to the distributor, said control device being operative for regulating the amount of recirculated tobacco without interrupting the operation of the cigarette making machine, said device comprising:

a detector head disposed in said suction duct, all of the trimmed excess tobacco being passed through said detector head, said detector head including a light source for producing a light beam and a photoelectric sensor disposed for receiving the light beam and producing a measurement signal proportional to the intensity of the light beam, the light beam attenuated by the trimmed excess tobacco passing through said head, wherein the measurement signal represents the amount of trimmed excess tobacco being recirculated to the distributor; and

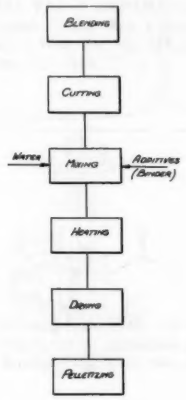
adjustable means connected for receiving the measurement signal and for controlling the tobacco dispensing rate of the distributor as a function of the measurement signal.

4,513,756

PROCESS OF MAKING TOBACCO PELLETS

Luther B. Pittman; Jennings M. Agner, and George F. Hunt, all of Owensboro, Ky., assignors to The Pinkerton Tobacco Company, Owensboro, Ky.

Filed Apr. 28, 1983, Ser. No. 489,389
Int. Cl.³ A24B *3/00*
U.S. Cl. 131—111 **11 Claims**



1. A process of making smokeless tobacco pellets, said process comprising the steps of

forming a blend of dark-fired and one-sucker tobacco, and a cased cigar type tobacco;

cutting said blend to obtain a shredded product sized to pass through a No. 20 Tyler screen;

adding a binder to the sized shredded product;

adding water to the sized granular product to obtain a mixture of tobacco, binder and water;

heating the mixture to a temperature sufficient to uniformly disperse the binder through the mixture;

thereafter drying the mixture to a moisture content of from 8% to 10% water by weight; and

pelletizing the dried mixture into individual discrete pellets.

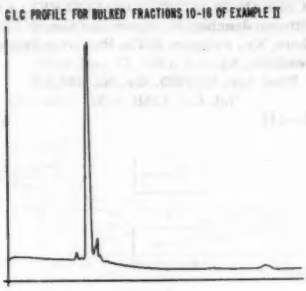
4,513,757

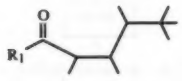
BRANCHED CHAIN SATURATED KETONES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Richard M. Boden, Ocean, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

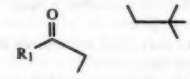
Division of Ser. No. 463,484, Feb. 3, 1983, which is a division of Ser. No. 399,067, Jul. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 354,389, Mar. 2, 1982, Pat. No. 4,405,820, which is a division of Ser. No. 252,334, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Mar. 14, 1984, Ser. No. 589,454
Int. Cl.³ A24B *3/12*
U.S. Cl. 131—276 **6 Claims**

4. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article comprising the step of intimately admixing with a smoking tobacco composition or smoking tobacco article component an aroma or taste augmenting or enhancing quantity of a composition of matter consisting essentially of at least one compound defined according to the structure:





wherein R_1 is C_1–C_3 lower alkyl produced according to a process consisting essentially of the step of contacting with hydrogen at least one compound defined according to the structure:



wherein R_1 is C_1–C_3 lower alkyl and one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents carbon-carbon single bonds in the presence of a catalyst at a temperature in the range of 100°–200° C. and at a pressure in the range of from 40–400 psig.

4,513,758

METHOD AND APPARATUS FOR INCREASING THE VOLUME OF TOBACCO

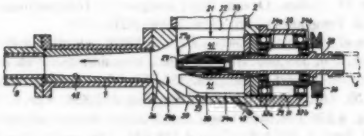
Bernard Henzelin, Boncourt, and Bernard Courbat-Chavanne, Buix, both of Switzerland, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,066

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217596

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—291 **19 Claims**



1. A method of increasing the volume of tobacco particles, comprising the steps of introducing moist tobacco particles into a first portion of a path having a second portion whose cross-sectional area is less than that of the first portion; rapidly transporting the particles of tobacco from the first portion of said path, including admitting from the second into the first portion of the path a high-speed stream of a gaseous fluid which entrains the particles of tobacco from the first portion of said path; and admitting into the first portion of said path a second fluid medium in a direction having a component coinciding with the direction of flow of said stream from the second portion into the first portion of said path.

4,513,759

APPARATUS FOR EXPELLING MOISTURE FROM TOBACCO OR THE LIKE

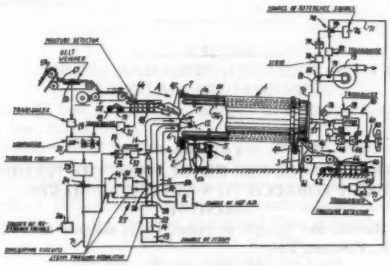
Waldemar Wochnowski, Hamburg-Meiendorf; Reinhard Hohm, Pinneberg; Reinhard Liebe, and Manfred Muss, both of Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,462

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126717

Int. Cl.³ A24C *9/00, 3/04*

U.S. Cl. 131—303 **16 Claims**



1. Apparatus for conditioning moisture-containing tobacco or a similar moisture-containing smokable material, comprising a transporting unit including a hollow rotary dryer defining a conditioning zone for the passage of a stream of moisture-containing smokable material therethrough; means for heating said dryer so that the latter transmits heat to and thereby expels moisture from the material during transport through said zone; and control means including means for monitoring the quantity of moisture in the material entering said zone per unit of time, a source of steam, adjustable steam admitting means for admitting steam from said source into said zone, and adjusting means for adjusting said steam admitting means so as to increase the quantity of admitted steam per unit of time when the quantity of moisture in the material entering said zone per unit of time decreases and vice versa.

4,513,760

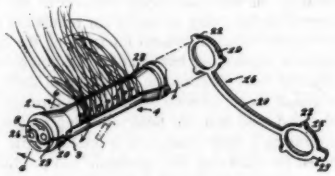
HINGED HAIR CURLING ROLLER

Walter Tihonovich, 1330 Pine, Pueblo, Colo. 81004

Filed Jun. 27, 1980, Ser. No. 163,927

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **4 Claims**



1. An elongated hair curling roller comprising in combination:

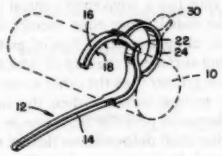
a pair of openable mating jaws having a pivotal hinge axis and wherein each of the jaws has a sinuous shaped interfacing surface reciprocally related to the other jaw taken in a cross-section parallel to the hinge axis, and further

comprising cooperatively contoured outside surfaces forming a closed plane curve in similar cross-section.

4,513,761
HAIR ROLLER CLIP

Gary E. Van Deursen, Upper Saddle River, N.J., assignor to Black & Decker, Inc., Newark, Del.

Filed Mar. 26, 1984, Ser. No. 593,582
Int. Cl.³ A45D *2/26*
U.S. Cl. 132—41 6 Claims



1. A hair roller clip comprising a one-piece self-adjusting member with components including a substantially straight base leg,

a connected top leg of semi-circular formation with a plurality of formed teeth interiorly thereof,

said base leg being a continuation of a second semi-circular formation connected to said top leg,

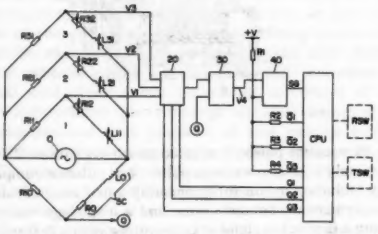
an over center spring member connected at each end to said respective circular formations,

whereby hair wound on a roller is secured in place to retain the roller on the user's head.

4,513,762
COIN SORTER WITH TIME-SHARING CIRCUIT

Shinji Yokomori, and Yoshihisa Nakajima, both of Nagano, Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 534,087
Claims priority, application Japan, Sep. 28, 1982, 57-169272
Int. Cl.³ G07D *5/08*
U.S. Cl. 133—3 R 7 Claims



1. A coin sorter for examining the genuineness of plural denominations of coins and for sorting the coins, comprising:

an AC bridge circuit having one arm comprising a detecting coil disposed along a coin passage on which coins roll, and having means for producing bridge output signals corresponding to different denominations of coins to be detected;

time-sharing signal generating means for producing time-sharing signals;

switching circuit means, connected to said time-sharing signal generating means, for receiving the bridge output signals and for successively delivering the bridge output signals to an output lead in response to the time-sharing signals;

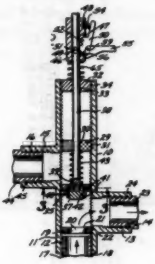
a single amplifier means connected to the switching circuit output lead for amplifying the bridge output signals successively delivered by the switching circuit means; and

a comparator for comparing the outputs from the amplifier means with predetermined reference values and for producing output signals indicating the denomination of coin detected.

4,513,763
INERTIAL VALVE APPARATUS

Ray L. Ware, 6620 English Colony Way, Penryn, Calif. 95663

Filed Dec. 2, 1983, Ser. No. 557,326
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—38 15 Claims



1. Inertial valve apparatus comprising:

a housing tube having an inlet port, an outlet port, and a vent port;

a valve contained within said housing tube moveable between an unactuated position where said inlet port is open, said outlet port is open, and said vent port is closed, and an actuated position where said inlet port is closed, said outlet port is open, and said vent port is open;

biasing means urging said valve towards the actuated position;

latch means holding said valve in the unactuated position against the urging of said biasing means;

inertial trigger means for releasing said latch means in response to vibrations, causing said valve to move to the actuated position;

a lower valve seat, having a lower valve seat aperture and defining said input port and attached to one end of said housing tube;

an upper valve seat, having an upper valve seat aperture, attached to the interior of said housing tube, positioned so that said output port is located between said upper valve seat and said lower valve seat;

a lower valve stem guide having a lower valve stem aperture whose axis is parallel to the axis of said housing tube, attached to the interior of said housing tube so that said vent port is located between said lower valve stem guide and said upper valve seat; and

an upper valve stem guide having an upper valve stem aperture whose axis is parallel to the axis of said housing tube, attached to the other end of said housing tube.

4,513,764
VALVE

John H. Yonker, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 27, 1983, Ser. No. 498,746
Int. Cl.³ E21B *43/12*
U.S. Cl. 137—68 R 8 Claims

4. A valve comprising:

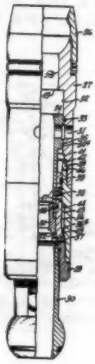
a housing having a flowway,

a port in said housing communicating the flowway with the exterior of the housing,

a two-piece telescoping valve member controlling flow through said port,

a low pressure dome in said housing provided in part by a first pressure responsive member carried by said valve member,

first releasable latch means initially latching said valve member in port open position and released in response to a selected differential across said first pressure responsive member,



second releasable latch means latching said valve member in port closing position upon release of said first latch means and movement of the valve means to port closing position by said first pressure responsive member, and

a second pressure responsive member on said valve member exposed to pressure within said flowway on one side and pressure exterior of the housing on the other side with said valve member in closed position,

said second releasable latch means including means releasably latching the two pieces of said valve member together and releasable in response to a selected differential across said second pressure responsive member to move said valve member to port opening position.

4,513,765

ARRANGEMENT ON A BUTTERFLY VALVE

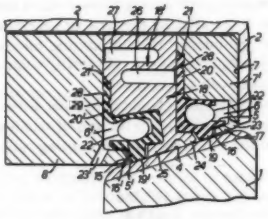
Erik Rishovd, and Sven Sorensen, both of Geithus, Norway, assignors to A/S Westad Armaturfabrik, Geithus, Norway

Filed Oct. 7, 1982, Ser. No. 433,410

Claims priority, application Norway, Oct. 14, 1981, 813467

Int. Cl.³ F16K 1/22

U.S. Cl. 137—72 **4 Claims**



1. An arrangement on a fireproof butterfly valve, having a converging sealing surface, intended especially for use with cryogenic fluids, wherein the axis of rotation of the flap is displaced in relation to a plane through the spherical sealing surface of the flap, which cooperates with two soft sealing rings disposed in the valve housing and separated by an intermediate ring of metal, opposing lateral surfaces of said intermediate ring being of complementary configuration in relation to the facing lateral surfaces of the sealing rings for retaining the sealing rings in undercut grooves formed between said opposing lateral surfaces of the intermediate ring and, respectively, a retainer ring and a circular seat in the wall of the valve housing, said undercut grooves each having a radial, inwardly open slit through which a radial, inwardly projecting sealing lip on the sealing rings extends for engagement with the sealing surface of the flap when the flap is in a closed position, said sealing rings being of the type which are affected by both spring pressure and fluid pressure, characterized in that the intermediate ring has a weakened central cross-sectional section and at the radial, inner edge thereof is formed with two axially spaced, circular sealing lips of metal for engagement with the sealing surface of the flap of which one of the sealing lips has a radius greater than the other according to the convergence of the sealing surface when the intermediate ring is subjected to forces of pressure from one or the other side, said pressure causing axial deformation/flexure of said radial, inner section and axial displacement of the lips of the intermediate ring from a plane through the flexure points of the radial, inner section whereby one or the other of the sealing lips is pressed into contact against the sealing surface of the flap, thereby obtaining a fireproof seal in the event of fire in the valve which destroys the soft sealing rings.

4,513,766

VACUUM PULSATOR VALVES

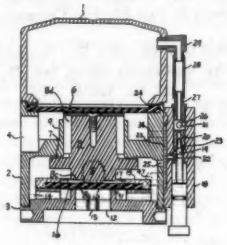
Thomas L. Seaborne, 10 Collier Crescent, Brunswick, Victoria, Australia

Continuation of Ser. No. 349,153, Feb. 16, 1982,. This application Jul. 16, 1984, Ser. No. 630,349

Claims priority, application Australia, Feb. 13, 1981, 7594/81

Int. Cl.³ A01J 5/12

U.S. Cl. 137—103 **26 Claims**



1. A vacuum pulsator adapted to supply pulses of vacuum alternately with non-vacuum pulses, said pulsator comprising a body including means for connecting a first zone of said body to a permanent vacuum source and a diaphragm valve comprising a first valve element cooperating with a first valve seat adapted to connect a second zone of said body to a non-vacuum source of air, said body further including a second valve seat adapted to be opened or closed to establish or prevent communication between said first and second zones, said body further housing a first deformable diaphragm having first and second opposed surfaces, means for alternately applying vacuum and non-vacuum pressures to the second surface of the first deformable diaphragm with said first surface of the first deformable diaphragm arranged for exposure to said permanent vacuum source, said first deformable diaphragm cooperating with said first valve element whereby said first valve element is movable such that when said second valve seat is closed, said first valve seat is open thereby applying non-vacuum air to said second zone, and when said second valve seat is open, said first valve seat is closed thereby applying vacuum to said second zone, the movement of said first de-

formable diaphragm and said first valve element being controlled by an adjustable ratio control valve means adapted to communicate a continuous restricted flow of non-vacuum air to the second surface of said first deformable diaphragm to control the ratio of vacuum/non-vacuum air in the pulses appearing in said second zone.

4,513,767

FLUID DISTRIBUTION SYSTEM

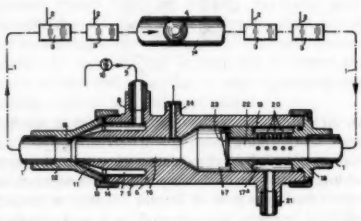
Eduard Soederhuyzen, 330 Staalmeesterslaan, 1057 PC Amsterdam, Netherlands

Filed Feb. 25, 1983, Ser. No. 469,588

Claims priority, application Netherlands, Feb. 26, 1982, 8200796

Int. Cl.³ A01G *27/00*

U.S. Cl. 137—119 **10 Claims**



1. In a fluid distribution system which comprises a conduit loop through which fluid can flow; means for supplying fluid to said conduit loop; a plurality of valve means located along said conduit loop, each valve means including a fluid outlet branch; and a plug positioned within said conduit loop and capable of passing therealong based on the flow of fluid therethrough, the sequential location of the plug in respective valve means causing fluid to flow through the associated fluid outlet branch,

the improvement wherein said plug is in the form of a smooth-surfaced sphere, and wherein each said valve means includes a housing defining an axial passageway therethrough and through which fluid can pass, and a passage member which is axially movable along said axial passageway, said passage member defining an axial channel therein and mounting movable retaining means which project radially inwardly thereof into said axial channel, said movable retaining means being fully extended into said axial channel and preventing movement of said smooth-surfaced sphere through said axial channel at first predetermined axial positions of said passage member within said axial passageway and being repositioned radially outwardly with respect to said axial channel and allowing said smooth-surfaced sphere to move through said axial channel at second predetermined axial positions of said passage member within said axial passageway, the axial positioning of the passage member in said housing determining whether or not fluid will pass through the fluid outlet branch connected thereto.

4,513,768

SOLAR ACTUATED DRAIN SYSTEM

Glen E. Sarver, and Bernard W. Worstell, both of Marietta, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 31, 1983, Ser. No. 528,191

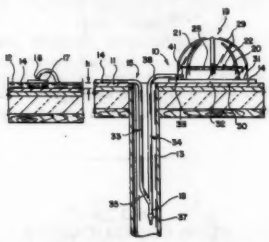
Int. Cl.³ F04F *10/00*

U.S. Cl. 137—142 **10 Claims**

1. A temperature actuated drain system for transferring a water accumulation from a roof surface to a lower level at which the water is discharged from the drain system, said drain system comprising:

(a) a siphon comprised of a first tubular member and a second tubular member, and

(b) an enclosed chamber with a bottom level comprised of a rigid upper component comprised of a wall that allows solar heat energy to pass therethrough into the interior of said chamber, a base member to which said upper component is hermetically sealed along its peripheral zone, and means confined within the confines of said chamber for absorbing solar heat energy during the period when the sun shines onto said chamber and radiating the collected heat energy into the confined air space within said chamber when the sun is not shining on said chamber, said first tubular member of said siphon having an inlet end for immersing in an accumulation of water to be drained from a roof surface and a distal end, said second tubular member of said siphon having a discharge end communicating with a pressure-responsive one-way valve means that



opens when the pressure within said siphon or the force of a column of water within said siphon and acting against said valve exceeds the force that maintains said valve normally closed and closes when the pressure within said siphon or the force of a column of water within said siphon and acting against said valve is less than the force that maintains said valve normally closed, said second tubular member of said siphon being in open communication with the interior space of said chamber at a location immediately adjacent the bottom level of the interior space of said chamber, said distal end of said first tubular member of said siphon being joined in communicating relationship with said second tubular member of said siphon, said discharge end of said second tubular member of said siphon being positioned at a level below the level of the inlet end of said first tubular member of said siphon during the operation of said drain system.

4,513,769

METHOD OF MANUFACTURING FAUCETS AND SPOUTS, FAUCET INSERTS, AND FAUCETS AND SPOUTS MANUFACTURED BY THE METHOD

Glenn T. Purcell, El Paso, Ill., assignor to Masco Corporation of Indiana, Taylor, Mich.

Filed Jun. 28, 1982, Ser. No. 392,887

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 **25 Claims**

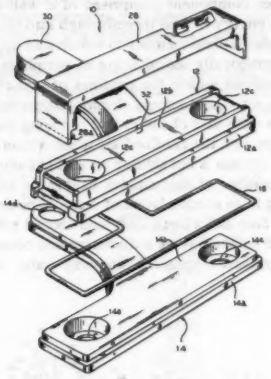
1. A faucet, characterized by:

a first housing member and second housing member connected together to form a fluid passageway therethrough having an inlet and outlet;

said members each have complementary flanges which mate with each other and to form a sealed seam that extends along the length of said fluid passageway;

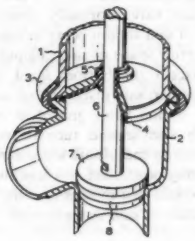
said first member also having an aperture therethrough aligned with an aperture in the second member; said apertures in communication with said fluid passageway;

operable valve means mounted in one of said apertures and the other of said apertures receiving a fluid line forming



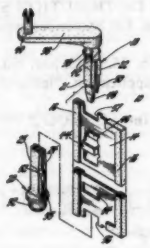
said inlet, with said valve means controlling fluid flow from said inlet and through said passageway to said outlet.

4,513,770
FLOW CONTROL VALVE
Philip A. Davy, Horsham, England, assignor to APV International Limited, Crawley, England
Continuation-in-part of Ser. No. 274,754, Jun. 18, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,489
Int. Cl.³ F16K *43/00, 41/00*
U.S. Cl. 137—315 **4 Claims**



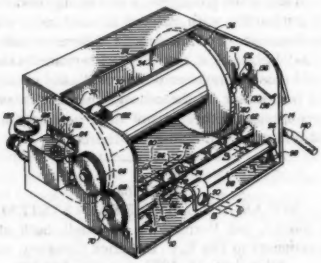
1. In a flow control valve having a casing made up from at least two separable casing parts, a flow control member mounted on a shaft axially movable in the said casing, a shaft seal mounted between said two of said separable casing parts and cooperable with the said shaft to isolate the interior of the casing, the said shaft seal comprising an insert having opposed faces and a resilient sealing member supported by the insert and having a pair of spaced sealing lips axially spaced along the shaft: the improvement that the sealing member includes a central boss carrying the spaced sealing lips and also a narrow radial flange and a wide radial flange mechanically interengaging on and about an inner edge of the insert, with the wide flange fitting flat against and covering the face of the insert on the interior side of the seal, and the insert and wide flange having peripheral edges located and trapped between the said two separable casing parts to present a substantially flat hygienic face of the wide flange to the interior of the valve casing with the insert isolated from the interior of the valve casing and fluid flow therethrough.

4,513,771
AIR VALVE
Michael J. Thomas, and David B. McDonald, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 7, 1983, Ser. No. 548,926
Int. Cl.³ F16K *1/22*
U.S. Cl. 137—315 **4 Claims**



1. An air valve adapted for installation in an air duct of a vehicle air conditioning, heating and defrosting system and the like characterized by a valve plate and a pivotal support and lever arrangement therefor comprising two separate support means each having a pair of fingers adapted to straddle said valve plate at opposite ends thereof, each said support means further having a bearing portion, said bearing portions adapted to be received in aligned support holes in said duct to thereby support said valve plate for pivotal movement therein, said valve plate and the fingers of both said support means having cooperating detent means for locking said support means on said valve plate so that said bearing portions are in axial alignment, at least one of said support means further having a lever, and snap-in means on said one support means intermediate its bearing portion and fingers for allowing installation of said one support means on said valve plate from external of and through one support hole in said duct but thereafter retaining such bearing portion in said one support hole to thereby retain both said lever and valve plate in place with said lever external of said duct.

4,513,772
AUTOMATIC HOSE REEL
Richard Fisher, 300 S. Val Vista #44, Mesa, Ariz. 85024
Filed Jul. 25, 1983, Ser. No. 516,518
Int. Cl.³ B65H *75/34*
U.S. Cl. 137—355.22 **17 Claims**



1. An apparatus for automatically winding a hose of the type which includes end couplers, said apparatus comprising:
a frame having first and second side members;
reel means rotatably and transversely coupled between said first and second side members for receiving said hose;
a motor coupled on said frame;

electrical switch means for coupling said motor to a source of power when in a first state, and for disconnecting said motor for said source of power when in a second state;

clutch means coupled between said motor and said reel means for selectively and imparting rotary motion from said motor to said reel means;

guide means coupled between said first and second side members for guiding hose to said reel means; and

first means coupled to said guide means and responsive thereto for substantially simultaneously disengaging said clutch and turning off said motor;

said guide means comprising an elongated externally threaded traversing screw journaled for rotation in said first and second side members and positioned substantially parallel to said reel means, second means coupled between said reel means and said traversing screw for rotating said traversing screw in response to rotation of said reel means, follower means mounted on said traversing screw and movable thereof on opposite directions during rotation of said traversing screw, and a guide assembly journaled for rotation in said first and second side members and positioned substantially parallel to said traversing screw for guiding hose to said follower means;

said guide assembly comprising:

a guide bar journaled for rotation in said first and second side members, and a yoke transversely slideable on said guide bar but rotatably fixed with respect thereto and having a transverse aperture therein of an inner diameter just sufficient to permit passage therethrough of said hose and insufficient to permit passage of said end couplers, said guide bar being caused to pivot when said yoke is engaged by one of said end couplers;

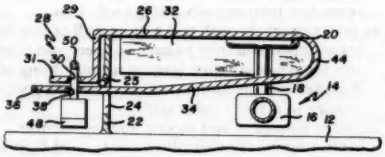
said first means comprising a projecting member fixedly coupled on said guide bar and pivotable therewith, a slide member hingedly coupled to said projecting member so as to move translationaly when said projecting member pivots, and a lever arm pivotably coupled in said frame and capable of assuming first, second and third positions in response to movement of said slide member, said first position for maintaining said electrical switch means in said first state and for maintaining engagement of said clutch means, said second position for disengaging said clutch means, and said third position for placing said electrical switch means in said second state.

4,513,773

VALVE GUARD

Brendon J. Hardiman, Jr., 258 Mower St., Worcester, Mass. 01602

Filed May 7, 1984, Ser. No. 607,601
Int. Cl.³ F16K *35/10*
U.S. Cl. 137—382 **8 Claims**



1. Valve guard for a gas tank having a valve at the top of the tank which includes a casing, a valve stem which extends vertically from the casing and a valve handle at the top of the stem, the gas tank also having a vertical flange which is spaced from the valve and which has an opening that is horizontally aligned with the valve, said valve guard comprising:

(a) a top wall adapted to overlie said valve handle and said vertical flange and having a forwardly extending upper lip which is adapted to extend over and beyond said flange, said upper lip portion having a first aperture,

(b) a plurality of vertical walls extending downwardly from said top wall, and

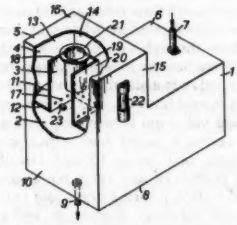
(c) a bottom wall operatively connected to said top wall and having a slot that enables the valve guard to be applied to the valve so that the bottom wall lies between the handle and the casing of the valve and the stem extends through said slot, the width of said slot being greater than the width of said stem and less then the width of said handle, said bottom wall having a forwardly extending lower lip which is adapted to extend through said flange opening and underlies said upper lip, said lower lip having a second aperture which is vertically aligned with said upper aperture for receiving the shackle of a lock.

4,513,774

APPARATUS FOR MINIMIZING THE AMOUNT OF FLUID LEAKED FROM A COMPONENT IN A HYDRAULIC POWER SYSTEM WHEN THE SYSTEM HAS FAILED

Donald J. Reid, Morpeth, England, assignor to British Gas Corporation, London, England

Filed Mar. 30, 1983, Ser. No. 480,306
Int. Cl.³ F16K *21/28*
U.S. Cl. 137—392 **8 Claims**



1. Apparatus for minimizing the amount of fluid leaked from a component in a hydraulic power system when the component has failed, the apparatus comprising a tank for use as the reservoir for the hydraulic fluid, the tank having a first chamber for storing a main volume of the fluid and a second substantially smaller chamber for storing a substantially smaller reference volume of the fluid than the main volume stored by the first chamber, the second chamber being located immediately above the first chamber and communicating therewith, and means for deactivating the system power source when the quantity of fluid in the second chamber has fallen to or below a preset level as a result of leakage of that fluid from the system, whereby the relative volumes of the chambers are such that for a given quantity of fluid entering or leaving the tank, fluid level fluctuation in the second chamber is greater than the corresponding fluid level fluctuation which would occur in the first chamber if the fluid were only entering or leaving the first chamber.

4,513,775

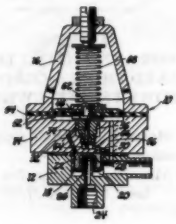
PRESSURE REGULATOR

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1983, Ser. No. 469,725
Int. Cl.³ F16K *31/385*
U.S. Cl. 137—491 **1 Claim**

1. A pressure regulator assembly comprising a housing having a regulated pressure region, an operating pressure chamber and an inlet, said assembly having an aperture for flow from said inlet to said chamber and an orifice for flow from said chamber to said region, a primary valve controlling flow

through said orifice, a regulator diaphragm associated with said primary valve, said regulator diaphragm being responsive to the pressure in said region for positioning said primary valve so that flow through said orifice maintains said region at a desired pressure when said primary valve restricts flow through said orifice, said housing also having an opening for flow directly from said inlet to said region, a secondary valve controlling flow through said opening, and a control diaphragm associated with said secondary valve, said control diaphragm being responsive to the pressure in said chamber for positioning said secondary valve so that flow through said opening is obstructed when said primary valve restricts flow through said orifice and the pressure in said chamber approaches the pressure in said inlet, said control diaphragm



being further responsive to the pressure in said chamber for positioning said secondary valve so that flow through said opening supplements flow through said orifice to maintain said region at the desired pressure when said primary valve permits maximum flow through said orifice and the pressure in said chamber approaches the pressure in said region, and wherein said primary valve is a slidable valve pin having a lap fit in a bore formed in said housing, said orifice opens into the side of said bore, said valve pin is provided with a shoulder defining an annular recess adjacent said orifice and an axial groove extending from said recess to said chamber, said shoulder forming the portion of said valve pin adapted to restrict flow through said orifice, a spring urges said valve pin into engagement with said regulator diaphragm, and a ball is interposed between said spring and said valve pin.

4,513,776

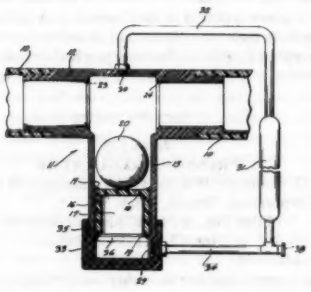
AUTOMATIC GAS SHUTOFF VALVE

Keith A. Chen, Milwaukee, Wis., assignor to Wisconsin Gas Company, Milwaukee, Wis.

Continuation of Ser. No. 875,322, Feb. 6, 1978, abandoned. This application May 22, 1980, Ser. No. 152,356

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—498 **4 Claims**



1. An automatic gas shutoff valve for interrupting the flow of gas in a distribution line upon the occurrence of a predetermined rate of drop of pressure in the line; a single cylinder having one end opening into the distribution line for admitting the gas into said cylinder; interrupting means comprising a sphere movably disposed within said cylinder so that a space is formed between said interrupting means and the closed end of said cylinder, said interrupting means being movable out of said cylinder and into said distribution line to interrupt the flow of gas through said distribution line and including an annular surface in said distribution line on each side of said cylinder, said annular surfaces being engageable by said sphere for interrupting the flow of gas in either direction depending upon which side of said cylinder the break in the distribution line occurred and the pressure differential on said sphere will retain it against one of said annular surfaces to prevent the flow of gas from the unbroken sides of the distribution line into the broken side of the distribution line; means admitting the gas from the line into the space at the closed end of said cylinder to equalize the pressure on both sides of said interrupting means, said admitting means restricting the rate of escape of the gas in said space so that when a predetermined rate of pressure reduction is exceeded in the distribution line due to a break in the line, a pressure differential will occur on said interrupting means causing the gas in said space to expand rapidly and shift said interrupting means into the distribution line to interrupt the flow of gas through the line.

4,513,777

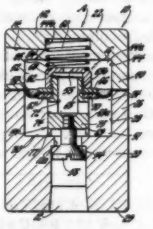
PRESSURE COMPENSATED FLOW CONTROL VALVE ASSEMBLY FOR FLUIDS CONTAINING FINELY DIVIDED SOLIDS

Dolph D. Wright, Union Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 22, 1983, Ser. No. 525,127

Int. Cl.³ G05D *7/01*

U.S. Cl. 137—501 **3 Claims**



1. A pressure compensating flow control valve assembly for fluids containing finely divided solids like paint comprising:

a housing means including first and second housing members each having an annular interior side wall and a bottom wall defining an interior bottom surface,

said housing members being secured together with their respective bottom walls facing each other,

an inlet passage through said bottom wall of said first housing member, said inlet passage adjacent said interior bottom surface of said first housing member being of a lesser diameter than the diameter of the remaining portion of the passage to define a valve seat,

an outlet passage in said second housing member,

a control means for controlling the flow of fluid from the inlet passage to the outlet passage,

said control means including a deflectable diaphragm whose outer periphery is clamped between the first and second housing members and which defines with said first and second housing members first and second chambers, respectively,

a valve means secured to said diaphragm, said valve means having a control orifice in communication with said second chamber, an axially extending passage in communication with said control orifice, transversely extending pas-

sages for communicating said axial passage with said first chamber, and a headed valve member disposed within said inlet passage and engageable with said valve seat, said valve means having an annular skirt adjacent said valve seat of said first housing member,

spring means having one end in abutting engagement with said bottom wall of said second housing member and the other end in abutting engagement with said valve means, said spring means plus the pressure of the fluid in said second chamber acting in opposition to the pressure of the fluid in said first chamber when fluid is flowing therethrough to normally bias said control means to a position in which said headed valve member is not in engagement with said valve seat to communicate said inlet passage with said first chamber,

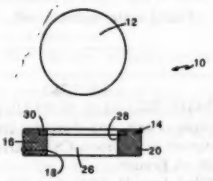
said control means being operable to maintain a substantially constant rate of flow of fluid through said valve assembly and causing said fluid to flow around the head of said valve member, then around the skirt into the first chamber, then laterally outwardly into the first chamber, then axially and laterally inwardly to said axial passage via said transverse passages in said valve means and then axially through said axial passage and control orifice and thence through said outlet passage whereby said fluid is agitated as it flows through the control valve assembly to minimize any settling out of said solids in said fluid.

4,513,778

CHECK VALVE

Amnon F. Vadasz, Caracas, Venezuela, assignor to Intevep, S.A., Caracas, Venezuela; Vereinigte Edelstahlwerke A.G., Vienna, Austria and Oficina Technica HGB, Estado Miranda, Venezuela

Filed Jul. 29, 1983, Ser. No. 518,193
Int. Cl.³ F16K *15/04*
U.S. Cl. 137—533.11 **14 Claims**



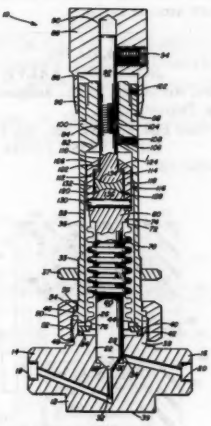
1. In a subsurface positive displacement pump used in the petroleum industry for pumping crudes characterized by a high degree of suspended particles, a ball check valve comprising a valve ball and a valve seat assembly wherein the valve seat assembly comprises a hollow cylindrical body defining an orifice through which pumped fluid passes, the hollow cylindrical body being provided with a recess on the surface facing the valve ball in the region defining the orifice wherein an insert which forms the actual valve seat for the ball valve is secured in the recess said insert is formed from a material having a hardness which is greater than the hardness of the material from which the valve ball is formed such that any effects of impact and erosion would tend to occur on the valve ball rather than the insert and said valve ball is formed from a material having a hardness which is greater than the hardness of the material from which the hollow cylindrical body is formed so as to dissipate the force generated by the impact of the valve ball on the insert.

4,513,779

METERING VALVE

James R. Owoc, McKeesport; John H. Thomas, and Richard W. Conley, both of Pittsburgh, all of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Aug. 12, 1983, Ser. No. 522,388
Int. Cl.³ F16K *37/00, 41/10*
U.S. Cl. 137—556 **16 Claims**



1. A valve comprising,

a valve body having a chamber therein,

said chamber including an upper portion with an opening therethrough and a lower portion having a valve seat,

inlet and outlet openings extending through said valve body and communicating with said valve seat,

a bonnet positioned in said chamber upper portion and connected to said valve body, said bonnet having a passageway therethrough aligned with said chamber,

a stem positioned for longitudinal movement in said bonnet passageway,

said stem including a lower end portion extending into said chamber lower end portion and being adapted to sealingly engage said valve seat,

said stem including an upper end portion with an arcuate surface positioned in said bonnet passageway,

an actuator rotatably supported in said bonnet passageway above said stem, said actuator including an upper end portion and a lower end portion with an arcuate surface,

coupling means positioned in said bonnet passageway for connecting said actuator lower end portion to said stem upper end portion to convert rotation of said actuator to nonrotational, longitudinal movement of said stem in said bonnet passageway to move said stem lower end portion into and out of engagement with said valve seat,

said coupling means including a housing with a bore therethrough,

said actuator lower end portion being positioned in the upper portion of said bore and provided with means for retaining said actuator lower end portion in said housing bore,

said stem upper end portion being positioned in the lower portion of said housing bore in spaced relation with said actuator lower end portion,

a bushing positioned in said housing bore between said actuator lower end portion and said stem upper end portion,

said bushing having a lower arcuate surface complementary with said arcuate surface of said stem upper end portion and an upper arcuate surface complementary with said arcuate surface of said actuator lower end portion,

said bushing being positioned in positive contact with said stem upper end portion and said actuator lower end por-

tion at said respective complementary arcuate surfaces, and

a pin extending through said coupling means and said stem upper end portion to move said arcuate surface of said stem upper end portion into compressive relation with said bushing lower arcuate surface and urge said bushing upper arcuate surface into compressive relation with said arcuate surface of said actuator lower end portion to maintain solid contact between said stem and said actuator through said bushing by the coaction through said complementary arcuate surfaces.

4,513,780

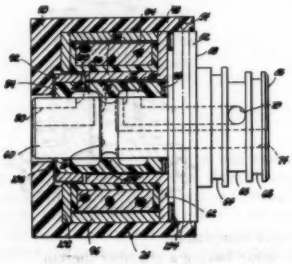
SOLENOID VALVE

David G. Evans, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1984, Ser. No. 578,124

Int. Cl.³ F15B *13/044*

U.S. Cl. 137—625.65 **3 Claims**



1. A solenoid valve comprising; a central core member having a cylindrical portion with a supply passage, a control passage and an exhaust passage formed therein and an end wall; a sleeve valve member slidably disposed on said core member having a plurality of annular recesses circumjacent said cylindrical portion and being movable thereon to provide selective communication between said supply passage and said control passage and between said control passage and said exhaust passage and said sleeve valve member also including a magnetically attractable ring member disposed on the outer periphery thereof; the solenoid coil surrounding at least a portion of said sleeve valve member and said central core and including a casing member which is operable to magnetically attract said magnetically attractable ring member when said solenoid coil is energized, spring means for urging separation between said magnetically attractable ring member and said casing member; and housing means including in part said end wall enclosing said coil and said sleeve valve member.

4,513,781

SANITARY SINGLE-CONTROL MIXER FITTING

Hans Nikolayczik, Minheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,674

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310080

Int. Cl.³ F16K *11/06, 19/00*

U.S. Cl. 137—625.41 **2 Claims**

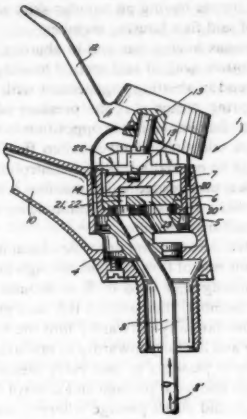
1. A sanitary single-control mixer fitting comprising:

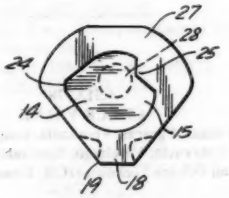
a valve body having regulating elements;

said regulating elements including at least two discs, of which one serves as a static valve seat disc, having two inlet ports for cold and hot water, and an outlet port;

said second disc is shiftably mounted on the said valve seat disc, and includes a mixing chamber cavity, which is sufficiently dimensioned for partial or complete connection of the inlet ports with the outlet port in said valve seat disc;

said mixing chamber cavity of said shiftable disc being asymmetrically formed in relation to a symmetrical formation of said inlets and outlet ports in the static valve seat disc; and





said mixing chamber cavity being shaped to reduce the flow cross sectional area of the inlet port for the cold water and is of greater cross sectional area than the hot water inlet so that the flow of hot water is substantially unaltered while the flow of cold water substantially reduced.

4,513,782

ELECTROHYDRAULIC SERVOVALVE DEVICE

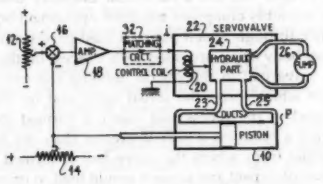
Giulio Contartese, Paris, and Joachim Dietz, Rungis, both of France, assignors to Thomson-CSF, Paris and Moog S.A.R.L., Rungis, both of, France

Filed Aug. 31, 1982, Ser. No. 413,551

Claims priority, application France, Sep. 11, 1981, 81 17235

Int. Cl.³ G05B *5/01*

U.S. Cl. 137—625.63 **8 Claims**



1. An electrohydraulic servovalve assembly comprising:

a hydraulic servovalve providing a hydraulic response as a function of a degree of opening of said servovalve;

electric servovalve control means responsive to an electric

control signal for controlling said degree of opening of said servovalve as a function of the magnitude and sense of said electric control signal, whereby a degree of opening of said servovalve in response to control signals of given magnitudes over the entire range of opening positions of said servovalve defines an actual response curve for said hydraulic response;

sensor means for sensing an actual servovalve hydraulic response in said actual response curve and outputting an actual response signal;

input means for providing an input signal corresponding to a desired servovalve response; and

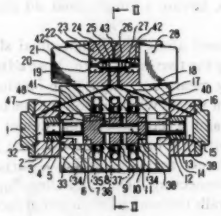
electric matching means preprogrammed with an ideal response curve of said hydraulic servovalve and receiving said input and actual response signals, said matching means being constructed so as to output a control signal to said control means of such a sense and magnitude that said actual response curve substantially matches said ideal response curve over said entire actual response for any actual response curve.

4,513,783

DIRECTIONAL CONTROL VALVE

Yukinobu Inoue, 70, Aza-Atsuta, Ohaza-Kochino, Kounan-shi, Aichi-ken 483, Japan

Continuation of Ser. No. 427,293, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 192,547, Sep. 30, 1980, abandoned. This application Sep. 24, 1984, Ser. No. 654,513
Claims priority, application Japan, Oct. 1, 1979, 54-126610
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—625.68 **1 Claim**



1. A multiple-way, linear reciprocating valve comprising:

a casing having a tank chamber;

a plate-type slide valve member slidably inserted in the tank chamber with a small clearance there-between and having a single internal pressure chamber bore inside the valve member, and notches on opposite ends of said member;

a slide valve member cover located on the upper surface of the casing;

a slide valve member base located on the lower surface of the casing, the slide valve member cover and base being spaced apart a distance which closely approximates the width of the valve member so that the valve member slides therein with a close tolerance;

three pairs of ring cups in the cover and the base aligned with each other and having biasing means consisting of coil springs biasing the ring cups towards the slide valve member;

only two pairs of upper and lower change-over ports in the slide valve member aligned with each other for selectively connecting the ring cups via the single internal pressure chamber bore inside the slide valve member, said two pairs of change-over ports communicating with each other through the single internal pressure chamber bore;

said slide valve member casing, cover and base forming at least one balance path between respective pairs of ring cups by communication therebetween;

port joints for respective ring cups for separately communicating with respective ones of the ring cups through the balance path and through the internal pressure chamber bore at a change-over position on account of the sliding of the slide valve member to cause a coincidence of respective ones of said change-over ports and ring cups; and

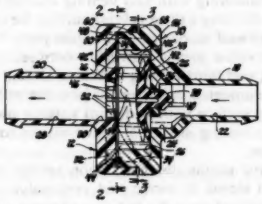
separate tank ports connected to opposite ends of said tank chamber, said notches in said opposite ends of said slide valve member serving to ensure drainage through said tank ports or port joints not coinciding with change-over ports.

4,513,784

CHECK VALVE ASSEMBLY

Robert M. Farrand, Saginaw, Mich., and Daniel Puzio, Boonton, N.J., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1984, Ser. No. 601,428
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—854 **3 Claims**



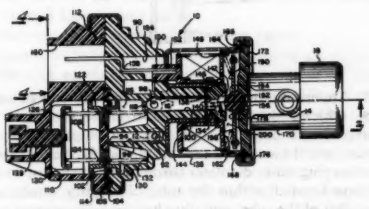
1. A check valve assembly having a valve chamber with an inlet port and an outlet port, an elastomeric umbrella valve contained in said chamber between said ports, a stem attaching said valve in a position to normally close said inlet port and be deflectable in response to differential fluid pressure acting in one direction to open said inlet port to permit forward fluid flow therethrough past said valve and through said chamber to said outlet port, inwardly projecting retention means in said chamber for retaining said valve in operational relationship with said inlet port in the event said valve becomes unattached so that any backward flow from said outlet port still forces closure of said valve on said inlet port, and bypass channel means in said chamber for maintaining forward fluid flow past said valve to said outlet port in the event said valve becomes unattached.

4,513,785

CONTROLLING ENGINE IDLE

Andrew A. Kenny, Roselle, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 1, 1982, Ser. No. 438,077
Int. Cl.³ F15B *13/06*
U.S. Cl. 137—881 **11 Claims**



1. A dual vacuum control signal generator comprising:

(a) housing means defining a vacuum control signal chamber

and a supply port therein adapted for connection to a source of vacuum;

(b) means defining a first valving surface in said chamber communicating with said supply port and a pressure responsive valve member moveable with respect to said valving surface for controlling fluid flow thereover between said vacuum chamber and said supply port operative for regulating vacuum level in said chamber about a predetermined level;

(c) means defining a first control signal port communicating with said vacuum chamber;

(d) means defining a venting passage in said vacuum control signal chamber including means defining a second valving surface;

(e) means biasing said pressure responsive valve member and applying a preload thereon;

(f) said housing means including means defining a venting chamber communicating with said venting passage and means defining a vent port communicating said venting chamber with atmospheric pressure;

(g) said housing means including a second control signal port communicating with said venting chamber and including means defining a third valving surface for controlling flow through said second control signal port;

(h) vent valve means moveable between a first position sealing said third valving surface with said second valving surface unsealed, and a second position sealing said second valving surface with said third valving surface unsealed;

(i) means biasing said vent valve means toward said first position;

(j) actuator means operable, upon receipt of an electrical control signal, to move said vent valve means between said first and second positions, wherein upon connection of said supply port to a source of vacuum, a vacuum output signal is provided to said first control signal output port, and upon connection of a regulated vacuum source to said second control signal port and upon said actuator means receiving an electrical control signal said vent valve means moves to control venting to said vacuum control chamber and said second control signal port thereby providing first and second control signals, respectively, to said first and second control signal ports.

4,513,786

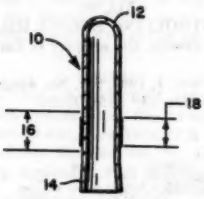
MECHANICAL TUBE PLUB

Jan H. Sodergren, and James W. Hales, both of Harrison, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 14, 1983, Ser. No. 484,742

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—89 **1 Claim**



1. Apparatus for removably sealing the end of an Inconel tube whichis thereby removed from service in a heat exchanger, including a hollow Inconel plug which can be inserted into the end of a tube, said plug having a substantially non-varying outer diameter throughout the major longitudinal portion located within the tube of slightly smaller diameter than that of the tube, said plug having a first closed end which enters the tube, and a second open end adapted to be flush with the tube end, a portion of plug near the second end being of slightly larger diameter to provide a light interference fit in the tube to hold the plug in place prior to and during the expansion thereof, and a band of ductile metal on a portion of the outer diameter of the plug, said band being approximately 2–4 mils thick, and being of either gold, silver, or pure iron, such that when the plug is expanded into tight engagement with the tube, the ductile metal is extruded into any crevices caused by irregularities in the inner wall surface of the tube.

4,513,787

CORRUGATED SHEATHING HOSE

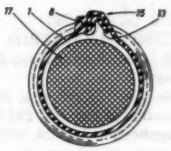
Wilhelm Hegler, Goethestrasse 2, D-8730 Bad Kissingen, and Ralph-Peter Hegler, Bad Kissingen, both of Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,744

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246594

Int. Cl.³ F16L *11/12*

U.S. Cl. 138—166 **14 Claims**



1. A corrugated sheathing hose of plastic, intended for electric installation, having a longitudinal slit along its side, comprising:

means, disposed along the longitudinal slit, for releasably connecting the two edges of the hose adjacent the slit, said connecting means defining a snap-locking closure including a detent recess which is continuous in the longitudinal direction and a corresponding detent protrusion, said detent protrusion having a detent nose disposed thereon and said detent recess including a corresponding undercut, said connecting means including opposing side walls, said side walls defining a longitudinal recess therebetween having an asymmetrical V-shape, said slit being located near, but offset from, the lowermost portion of said recess thereby forming said detent nose.

4,513,788

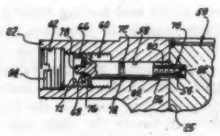
FLANGE SYSTEM FOR PIPELINE PLUGGING

Melvin D. Coker, Montebello, Calif., and John W. Wegner, Deer Park, Tex., assignors to Koppl Company Inc., Montebello, Calif.

Filed Nov. 28, 1983, Ser. No. 555,371

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—89 **9 Claims**



1. In a flange system for locking a plug in a pipeline flange, said plug having a first annular groove, the combination of:

a flange including an axial passage therethrough for receiving pipeworking tools or a pipeline plug, said flange having at least one radial passage for receiving locking means for locking a pipeline plug, each said radial passage including a threaded driver bore and a pin bore;

at least one locking means for engaging said first annular groove for locking a pipeline plug in place, said locking means including a driver threadedly carried in said driver bore and a pin carried and freely slidable in said pin bore and flexibly attached to said driver, with the axial distance moved by said pin in said pin bore being substantially equal to the axial distance moved by said driver by rotation thereof within said driver bore; and

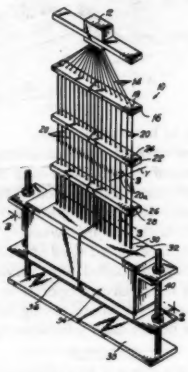
first attachment means for attaching said flange to a pipeline connection.

4,513,789

JACQUARD HARNESS ATTACHMENT MECHANISM

John C. Bowen, Jr., deceased, late of Morris County, N.J., and by Wiley C. Bowen, executrix, Lakewood, Ohio, assignors to The Baxter Corporation, Hawthorne, N.J.

Filed Jun. 13, 1983, Ser. No. 505,083
Int. Cl.³ D03C *3/00, 3/40, 3/44*
U.S. Cl. 139—85 **5 Claims**



1. In a Jacquard loom for producing woven patterns in fabric by selectively positioning a first group of yarn elements relative to a second group of yarn elements, under the control of predetermined program means, including a plurality of heddles linked individually to corresponding ones of said first group of yarn elements, spring means for exerting downward tension on each of said heddles, and alignment means including a plurality of apertures through which said spring means extend at their lower ends regions, said alignment means defining a retaining position for said spring means;

the improvement comprising that:

(a) each said spring means is a unitary spring having a plurality of interconnected helical coils, and

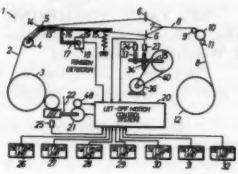
(b) each said spring includes a first segment connected to a respective one of said heddles and of a diameter to pass through a respective one of said apertures, and a second segment located below said alignment means and of a larger diameter then said first segment, said second segment being in substantial contact with a portion of said alignment means and incapable of passing through said aperture.

4,513,790

METHOD AND APPARATUS FOR CONTROLLING MOTOR-DRIVEN LET-OFF MOTION FOR LOOMS

Tsutomu Sainen; Toshiyuki Sakano; Yoshitaka Fujita, all of Kanazawa, and Toshiki Imai, Matsuto, all of Japan, assignors to Tsudakoma Corp., Kanazawa, Japan

Filed Feb. 13, 1984, Ser. No. 579,248
Claims priority, application Japan, Feb. 25, 1983, 58-31451
Int. Cl.³ D03D *49/10*
U.S. Cl. 139—110 **6 Claims**



1. A method of controlling a motor-driven let-off motion in a loom including a system for controlling a let-off motion motor, comprising the steps of:

(a) sampling a variation of warp tension during each revolution of a main shaft of the loom;

(b) effecting at least proportional and integral control modes on the average of sampled values;

(c) adding a proportional and integral output to a basic speed signal at a prescribed ratio; and

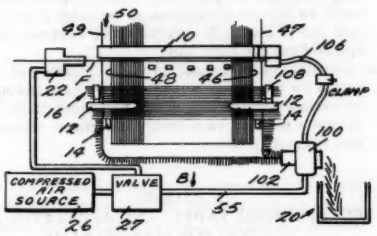
(d) applying a sum signal to the system for controlling the let-off motion motor.

4,513,791

LENO SELVAGING AND STRETCH NOZZLE SYSTEM

Douglas M. Dillon, Asheboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 1, 1983, Ser. No. 462,977
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—194 **5 Claims**



1. In an air jet loom for weaving fabric from warp yarns and filling yarns, said loom comprising:

a reed disposed transversely of said warp yarns;

air jet means, including at least one pressurized air source, for effecting predetermined relative dispositions of said filling yarns to said warp yarns and reed, said filling yarns extending beyond said warp yarns and weaving with leno yarns to form respective fringes on the sides of said fabric;

tensioning means for providing tension in said filling yarns and comprising: a Venturi device, responsive to pressurized air from said air jet means pressurized air source and having at least first and second output ports, for generating a suction at said first output port and exhausting pressurized air at said second output port; and a suction nozzle, communicating with said Venturi device first output port and coupled for movement with said reed, disposed

for receiving said filling yarns whereby a tension is generated in said filling yarns; and

trimming means, for removing said fringes and disposed of the removed fringes, said trimming means including suction generating means, communicating with said Venturi device second port, and disposed to receive said removed fringes, for generating a suction from said exhaust pressurized air, which suction operates upon said removed fringes.

4,513,792

WEFT YARN TENSIONING DEVICE

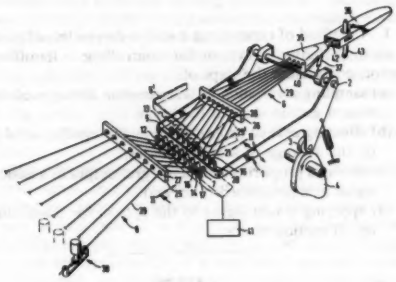
Paul Lincke, Zell, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 5, 1983, Ser. No. 482,243

Claims priority, application Switzerland, Apr. 7, 1982, 2145/82

Int. Cl.³ D03D *47/25, 47/34*

U.S. Cl. 139—439 **10 Claims**



1. A weft yarn tensioning device for a weaving machine, said device comprising

a rod of U-shaped transverse cross-section for disposition transversely of a row of weft yarns and movable between a yarn deflecting position and a yarn releasing position;

a plurality of retaining means for retaining the weft yarns at said deflecting position, each retaining means including a hook for movement between an extended position within said rod to engage a weft yarn and a retracted position spaced from the yarn; and

an activating means connected to said plurality of retaining means for selectively actuating each said retaining means to retain a selected yarn in said deflecting position and to release a selected yarn during movement of said rod to said releasing position.

4,513,793

SECURITY WIRE FABRIC AND APPARATUS AND METHOD FOR MAKING SAME

Herbert E. Rohrbacher, Whittier, Calif., assignor to Bergandi Manufacturing Co., Inc., South El Monte, Calif.

Filed Apr. 28, 1983, Ser. No. 489,540

Int. Cl.³ B21F *21/00*

U.S. Cl. 140—92.4 **26 Claims**

1. An apparatus for processing wire to produce a wire fabric of open construction and with the wire fabric formed with small openings relative to the gauge of the wire so as to form a security mesh, including,

coiling means for coiling the wire to have small loops,

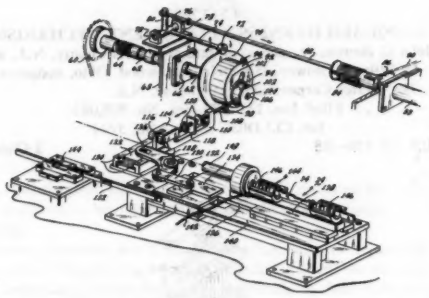
cutting means positioned adjacent the coiling means for cutting the coiled wire into individual lengths,

weaving means positioned adjacent the cutting means for repetitively interweaving the coiled wire before the coiled wire is cut with the coiled wire lastly cut to form the security mesh with the interweaving operation of one individual length of coiled wire at a time,

the cutting means cutting the coiled wire into individual lengths by cutting out a small portion of an individual loop of the coiled wire, and

shifting means coupled to the coiled wire for alternately shifting the coiled wire forward and backward for successive interweaving operations for providing the proper orientation for interweaving between the lengths of coiled wire before each interweaving operation.

12. A method of processing wire to produce a wire fabric of open construction and with the wire fabric formed with small openings relative to the gauge of the wire so as to form a security mesh, including the following steps:



coiling the wire to have small loops,

cutting the coiled wire into individual lengths by cutting out a small portion of an individual loop of the coiled wire,

repetitively interweaving the coiled wire before the coiled wire is cut with the coiled wire lastly cut to form the security mesh with the interweaving operation of one individual length of coiled wire at a time, and

alternately shifting the coiled wire forward and backward for successive interweaving operations for providing the proper orientation for interweaving between the lengths of coiled wire before each interweaving operation.

4,513,794

WIRE FORMING MACHINE

Fritz Witte, Wendlingen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,079

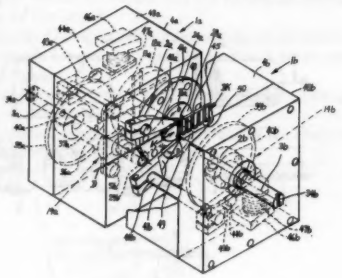
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145275

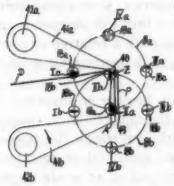
Int. Cl.³ B21F *1/00*

U.S. Cl. 140—105 **24 Claims**

1. A machine for converting a continuous length of wire into an undulate product, especially into an elongated comb-like product wherein closely adjacent substantially hairpin-shaped prongs alternate with substantially straight webs extending in the longiduinal direction of the product, comprising a support; first and second rotary tool carriers mounted in said support, defining a forming channel and being indexible about discrete first and second axes, said carriers having surfaces flanking said channel; wire deforming means including first and second sets of wire deforming tools eccentrically and movably mounted on the respective carriers and being equidistant from the respective axes as well as from one another, as considered in the circumferential directions of the respective carriers; means for

alternately indexing said first and second carriers in opposite directions about the respective axes so that the respective tools orbit along first and second endless paths which partially overlap each other in said channel, said indexing means being mounted in said support; means for supplying wire to said channel and into the range of said tools so that the wire is alternately engaged and deformed by said first and second tools; means for separating the thus deformed wire from the tools in said channel; means for moving said tools with reference to the respective carriers including means for introducing said tools into said channel prior to engagement of such tools with the wire and for retracting the tools from said channel upon completed bending of the wire by such tools, said separating means and said moving means being mounted in said support; and mobile wire urging means cooperating with said tools for maintaining the wire in contact with the tools in said channel during the intervals between successive indexing movements of the respective carrier.



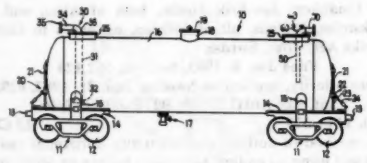


4,513,795

TANK WITH SELECTIVELY VARIABLE AUTOMATIC OUTAGE

Edward L. Davis, Youngstown, and Erling Mowatt-Larssen, Warren, both of Ohio, assignors to General American Transportation Corporation, Chicago, Ill.

Filed May 20, 1983, Ser. No. 496,576
Int. Cl.³ B65B *31/00*; F17D *1/00*
U.S. Cl. 141—35 **20 Claims**



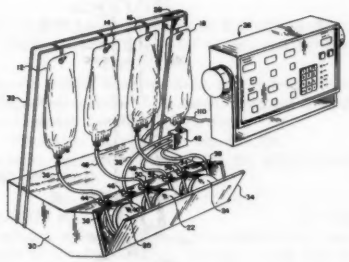
15. In a railway tank car having a tank adapted for interconnection and fluid communication with the tanks of associated like tank cars by connecting conduits for accommodating loading of liquid ladings into the tanks consecutively in series, wherein the tank includes a first lading conduit coupled thereto in fluid communication therewith and extending outwardly therefrom adjacent to the top thereof for connection to one of the associated connecting conduits, the improvement comprising: a second lading conduit coupled to the tank in fluid communication therewith, said second lading conduit having a first portion of relatively large cross-sectional area and a second portion of relatively small cross-sectional area, said first portion having an outer end extending outwardly from the tank adjacent to the top thereof for connection to another one of the associated connecting conduits and an inner end extending inwardly of the tank to the maximum fill level thereof, said second portion extending from the inner end of said first portion downwardly to the minimum fill level of the tank, said first portion having a vent opening at the inner end thereof completely within the perimeter thereof and outside the perimeter of said second portion, vent conduit means coupled to said second lading conduit in parallel with said second portion thereof, said vent conduit means communicating directly with said first portion of said second lading conduit at the vent opening therein and having an inner end disposed within the tank at a predetermined desired fill level between the maximum and minimum fill levels of the tank, and means for varying the level at which said inner end of said vent conduit means is disposed thereby to vary the predetermined fill level of the tank.

4,513,796

HIGH SPEED BULK COMPOUNDER

Carl Miller, Lake in the Hills, and Lawrence R. Hogan, Lake Villa, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 24, 1982, Ser. No. 391,759
Int. Cl.³ B65B *3/30*
U.S. Cl. 141—83 **1 Claim**



1. A system for volumetrically compounding at least two fluids having different specific gravities comprising:

a source of a first fluid having a first specific gravity,

a source of a second fluid having a second specific gravity different than said first specific gravity,

a compounding container communicating with each of said filuid sources for receiving a desired volume of said first fluid and a desired volume of said second fluid,

first pumping means for conveying said first fluid from its source into said compounding container,

second pumping means for conveying said second fluid from its source into said compounding container, and

means for individually controlling said first and second pumping means including

means for entering and registering said first specific gravity and said desired volume of said first fluid to be conveyed into said compounding container,

means for registering a first control value comprising the product of said first specific gravity and said desired volume of said first fluid,

means for entering and registering said second specific grav-

ity and said desired volume of said second fluid to be conveyed into said compounding container,

means for registering a second control value comprising the product of said second specific gravity and said desired volume of said second fluid,

means for sensing the weight of the contents of said compounding container,

first control means operative, when said sensed weight of the contents of said compounding container is less than said first control value, for operating only said first pumping means to convey only said first fluid into said compounding container, and

second control means operative, when said sensed weight of the contents of said compounding container is equal to or exceeds said first control value, for terminating the operation of said first pumping means and for operating only said second pumping means to convey only said second fluid into said compounding container until the increase in said sensed weight of the contents of said compounding container during operation of said second pumping means generally equals said second control value.

4,513,797

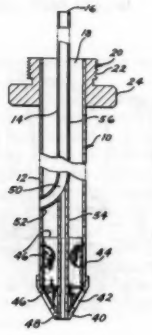
ONE-PIECE LIQUID FILLER TUBE

Roy J. Tompkins, Jr., Louisville, Ky., assignor to The Tomkins Co., Louisville, Ky.

Filed Jun. 14, 1984, Ser. No. 620,663

Int. Cl.³ B65B *3/18, 3/22*

U.S. Cl. 141—198 **9 Claims**



1. A liquid filler tube for insertion down through the neck of a bottle, said filler tube comprising:

a. a first elongated outer tube having an open upper end supplied with an external mounting connection adapted to be joined to a tank of a high speed bottle filling machine;

b. the lower end of the elongated tube having a conical tip with a wall and with a series of large radially spaced discharge holes in the wall, and a second series of large radially spaced discharge holes in the lower end of the said tube adjacent the conical tip and staggered with respect to the first series of discharge holes, and a coarse mesh screen covering each discharge hole;

c. and a second inner vent tube of smaller diameter extending completely through the elongated tube and joined at its lower end through the conical tip and at its upper end extending upwardly beyond the open upper end of the first tube;

d. the said vent tube having an intermediate conduit joined through the wall of the first tube and serving as a fill height limit means.

4,513,798

SHARPENER, SPECIFICALLY FOR COSMETIC STICKS

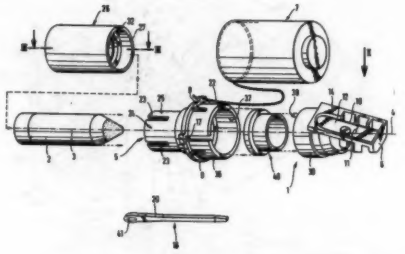
Werner Lüttgens, Erlangen, Fed. Rep. of Germany, assignor to A. Klebes GmbH & Co. K.G. Kunststoff- und Metallwarenfabrik, Erlangen, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,605

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145536

Int. Cl.³ B43L *23/00*

U.S. Cl. 144—28.11 **17 Claims**



1. A sharpener for sharpening an end of a writing stick which has a soft interior, sharpening being effected by inserting the writing stick into the sharpener and rotating the sharpener and the writing stick relative to each other, the sharpening of the writing stick generating waste material, said sharpener comprising:

a sharpener body having an insertion end with an opening for receiving the end of the writing stick and a longitudinal axis extending through the opening;

a sharpener blade mounted on said body and having a cutting edge arranged at an acute angle with respect to the longitudinal axis of said body;

a chip collecting cap having an interior wall and removably mounted on said body for enclosing an end of said body remote from said insertion end, said chip collecting cap being movable relative to said body between a secure position in which it is secured against rotation relative to said body and a released position in which it is rotatable relative to, and about the longitudinal axis of, said body; and

means defining a cleaning projection supported by said body, extending parallel to the longitudinal axis of said body into said chip collecting cap and being adjacent the interior wall of said chip collecting cap for scraping waste material from said interior wall when said chip collecting cap is rotated relative to said sharpening body.

4,513,799

METHOD OF CUTTING SUBSTANTIALLY HORIZONTAL CANTILEVERED OBJECTS SUCH AS LOGS, AND APPARATUS FOR CARRYING OUT THE METHOD

Thore Lindblom; Jan-Erik Hedin, both of Alfta, and Sven Wickström, Bollnäs, all of Sweden, assignors to Ostbergs Fabriks AB, Alfta, Sweden

Filed Jun. 8, 1983, Ser. No. 502,128

Claims priority, application Sweden, Jun. 21, 1982, 8203852

Int. Cl.³ A01G *27/08;* **B27B** *1/00, 13/00*

U.S. Cl. 144—379 **13 Claims**

1. A method of cutting a substantially horizontal cantilevered object using an endless saw chain having an upper operative portion and a lower return part, said lower return part guided by a chain guide, said method comprising the steps of:

a. moving the upper operative portion of the saw chain upwards from below the cantilevered object to cut the object; and

b. providing a gap between the upper operative portion of

the saw chain and the lower return part and chain guide so that the lower edge portions of the cut surfaces of the cantilevered object may bear against each other under the bending moment of the cantilevered portion of the object without impairing the cutting action of the saw chain.

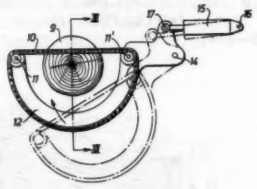
6. An apparatus for cutting a substantially horizontal cantilevered object using an endless saw chain having an upper cutting portion and a lower return part, said apparatus comprising:

saw support means for supporting the apparatus during the cutting of the object;

a substantially U-shaped chain guide means, mounted on said saw support, for arcuately guiding the lower return part of the saw chain;

a guide sprocket attached to one end of the chain guide means;

a drive sprocket attached to the other end of the chain guide means for driving the saw chain;



said guide sprocket and said drive sprocket guiding the upper cutting portion of said saw chain in a substantially straight line;

said upper cutting portion and said guide means being arranged so as to define an internal space through which no other part of the apparatus passes, said internal space having a width and height greater than that of the cantilevered object at the point of cutting; and

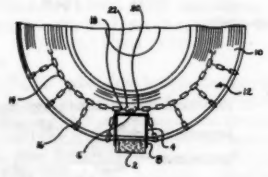
means for mechanically moving said chain guide means upwards from below said object such that said upper cutting portion of said saw chain cuts substantially from below and upwards through said object and such that said chain guide means remains disposed outside and below said object while the object is cut, and there being no other part of said apparatus passing through said internal space, the lower edge portions of the cut surfaces of said object are permitted to bear against each other without impairing the cutting action of the saw.

4,513,800

TIRE CHAIN MOUNTING DEVICE

Earl H. Vossenkemper, 10646 Arboretum Pl., San Diego, Calif. 92131

Filed Sep. 30, 1982, Ser. No. 429,976
Int. Cl.³ B60C *27/06*
U.S. Cl. 152—213 A **12 Claims**



1. A tire chain mounting device comprising:

(a) a spacer means adapted to space a tire a distance above a surface upon which the tire had been resting, the distance being suitable to permit disposition of portions of the chain beneath the tire, the spacer means being further adapted not to obstruct said disposition;

(b) an open link means used to couple end links of a side segment of the tire chain; and

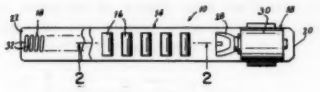
(c) an open link temporary holding means adapted to hold the open link means at a position suitable for a coupling of said end links, the open link temporary holding means being engaged with and held in place by the spacer means.

4,513,801

BAND GRIPS

Joseph F. Pedrick, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Mar. 9, 1984, Ser. No. 588,065
Int. Cl.³ B60C *27/02*
U.S. Cl. 152—213 R **4 Claims**



1. A gripping device for a motor vehicle tire which comprises:

(a) an elongated band of flexible material having a plurality of ground gripping outward deformations; and

(b) means for interconnecting respective ends of said band for securing said band about the tire, mounted on a vehicle wheel with the ground gripping outward deformations in place across tread of the tire wherein said means for interconnecting respective ends of said band being a worm-gear hose clamp type drive assembly.

4,513,802

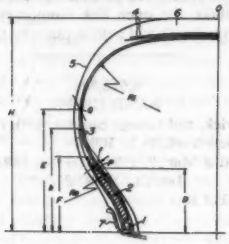
REDUCED ROLLING RESISTANCE PNEUMATIC RADIAL TIRE AND METHOD OF MANUFACTURING THE SAME

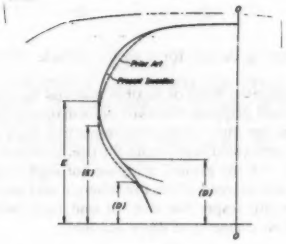
Minoru Togashi, Tokyo; Kenshiro Kato, and Shin-ichi Furuya, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,390
Claims priority, application Japan, Mar. 16, 1982, 57-40231; Sep. 13, 1982, 57-158013
Int. Cl.³ B60C *3/00, 15/06*
U.S. Cl. 152—353 R **17 Claims**

1. In a reduced rolling resistance pneumatic radial tire including a pair of annular sidewalls having at inner ends bead portions, respectively, a crown portion extending between radially outer ends of said sidewalls, a carcass of at least one ply including organic fiber cord layers and having ends extending about bead wires embedded in said bead portions with distal ends extending radially outwardly to reinforce said bead portions, said sidewalls and said crown portion, and hard rubber fillers filled in turns of said ply extending about said bead wires, the improvement comprising said carcass having, on each side of a plane including an equatorial line of the tire in a radial cross-section passing through a rotating axis of the tire, an outwardly extending configuration with a center of a radius of curvature positioned in an inside of the carcass in a radially outer zone from a carcass maximum width position to said crown portion and further having an inwardly extending configuration continuous with said outwardly extending configuration with a center of a radius of curvature positioned in an outside of said carcass in a radially inner zone from said carcass maximum width portion to said bead portion when said tire mounted on a rim is filled with an inner pressure 5% of a normal inner pressure; said outwardly extending configuration of said carcass in said radially outer zone being maintained permitting a small change in configuration, while said inwardly extending configuration of said carcass in said radially

inner zone being changed into a modified inwardly extending configuration with an increased radius of curvature when said tire on the rim is filled with the normal inner pressure; and a height of said carcass maximum width portion from a bead base being within a range of 50–65% of a height of the outer-





most portion of said crown portion from said bead base and a height of a junction of said outwardly and inwardly extending configurations from said bead base being within a range of 20–35% of said height of the outermost portion of said crown portion when said tire on the rim is filled with said normal inner pressure and equilibrated.

4,513,803

INFLATING GAS FOR TIRES

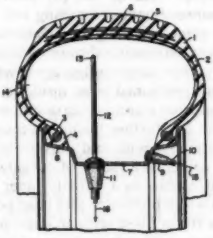
Thorsten Reese, Neustadt, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 121,642, Feb. 14, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,077

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906151

Int. Cl.[3] **B60C** *29/00*

U.S. Cl. 152—427 **8 Claims**



1. A filling gas mixture for a vehicle tire provided with at least one hollow chamber, especially a vehicle tire, with a body of rubber or rubber-like material provided suitably with reinforcement inserts, the improvement therewith comprising: a chemically inert heavy filling gas mixture that consists of air and sulfur-hexa-fluoride and particularly that air volume in relation to volume of the sulfur-hexa-fluoride has a ratio in a range of approximately 1:1 to 1:8.5 having obstructive diffusion characteristics of sulfur-hexa-fluoride exclusively for inflation of the body of rubber or rubber-like material of the vehicle tire.

4,513,804

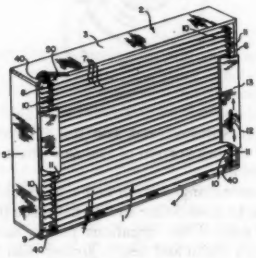
VENETIAN BLIND HANGER PIVOT ASSEMBLY INCLUDING A HANGER PIVOT MEMBER HAVING A SLAT ENGAGING SURFACE

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Division of Ser. No. 387,035, Jun. 10, 1982, Pat. No. 4,458,740, which is a continuation-in-part of Ser. No. 332,809, Dec. 21, 1981, abandoned. This application May 17, 1984, Ser. No. 611,208

Int. Cl.[3] **E06B** *9/36*

U.S. Cl. 160—174 **2 Claims**



1. A veneitan blind assembly comprising a plurality of slats including an upper end slat and a lower end slat, a hanger pivot member connected to each said upper end and lower end slats and having a slat engaging surface, each said hanger member including a pivot bearing portion, slat supporting means including tape cables secured to each hanger pivot member and extending between said upper end slat and said lower end slat, and suspension means pivotally mounting said hanger pivot members to parts of a frame opening whereby pivotal movement of a hanger pivot member with respect to said suspension means will cause all of said slats to tilt.

4,513,805

DECELERATOR FOR USE IN ROLLER BLINDS

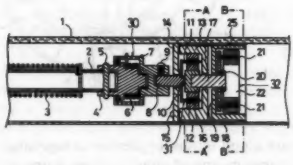
Ryoichi Mase, Tokyo, Japan, assignor to Toso Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,577

Claims priority, application Japan, Apr. 30, 1982, 57-61938[U]

Int. Cl.[3] **F16H** *3/44;* **F06B** *9/208*

U.S. Cl. 160—299 **5 Claims**



1. A decelerator for use in roller blinds of the type having a

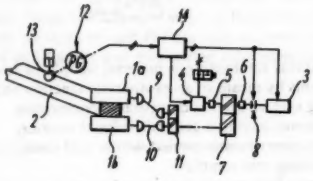
spring-motor interposed between a fixed shaft and a tube, comprising one-way clutch means having the stator thereof secured to the fixed shaft, epicyclic gearing means having a rear gear secured to the inside of the tube, a sun gear, a plurality of planet gears rotatably supported by the rotator of said one-way clutch means to engage said sun gear and said ring gear, and centrifugal braking means having a brake drum secured to the inside of the tube, a rotary shaft fixed to said sun gear, and centrifugally expansible brake shoes mounted on said rotary shaft, said one-way clutch permitting said planet gears to rotate about said sun gear together with the tube in a given direction but preventing said planet gears from rotating about said sun gear with the tube in the opposite direction.

4,513,806

APPARATUS FOR WITHDRAWING SOLIDIFIED ROD IN HORIZONTAL TYPE CONTINUOUS CASTING MACHINES

Shinzo Iida; Katsuji Ie, and Jun Miyazaki, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 23, 1983, Ser. No. 497,017
Int. Cl.³ B22D *11/16, 11/04*
U.S. Cl. 164—413 **7 Claims**



1. A horizontal type continuous casting apparatus including a means for withdrawing the cast strand, said apparatus comprising in combination:

a pair of pinch rollers;

a forward drive motor of a large capacity for driving said pinch rollers in a forward direction;

a clutch for disconnectedly connecting said forward drive motor to said pinch rollers;

a reversible constant-load motor for driving said pinch rollers in a reverse direction;

strand motion detectors for detecting forward and backward movements of said cast strand; and

a control means for engaging and releasing said clutch in response to output signals of said motion detection means.

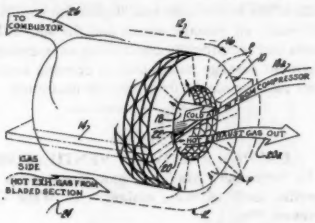
4,513,807

METHOD FOR MAKING A RADIAL FLOW CERAMIC ROTOR FOR ROTARY TYPE REGENERATOR HEAT EXCHANGE APPARATUS: AND ATTENDANT CERAMIC ROTOR CONSTRUCTIONS

Douglas N. Rose, Macomb, and John E. Becker, Oakland, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 489,969
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—10 **2 Claims**

1. A unitary ceramic radial flow heat exchange regenerator, the regenerator having a generally toroidal configuration with a plurality of radially extending passages, the passages having a relatively smaller cross sectional area at the inner portion of the toroidal structure and a relatively larger surface area at the outer surface of the regenerator including: a continuous helically wound strip of ceramic material having a substantially uniform cross section, the edges of the strip being substantially the same length, the strip being formed in a nonuniform corrugated structure so that the innermost portion of the strip has a first wave structure and the outermost portion of the strip has a second wave structure, the first wave structure having a shorter wave length than the second wave structure, the upper and lower positions of the first and second wave structures lying in the same plane and the adjacent wraps of the strip



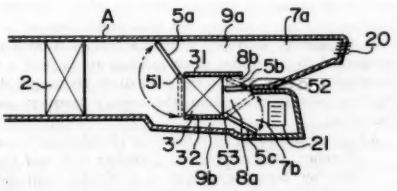
having a phase difference of one-half wave length so that the ridges of one wrap are in registry with the furrows of the adjacent wrap; and two annular ceramic sealing caps, one disposed on each end of the regenerator.

4,513,808

AUTOMOBILE AIR CONDITIONER

Tosikazu Ito, Ibaraki, and Reijiro Takahashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,591
Claims priority, application Japan, Feb. 4, 1981, 56-14255
Int. Cl.³ B60H *3/00;* **B61D** *27/00;* **F25B** *29/00*
U.S. Cl. 165—43 **9 Claims**



1. An automobile air conditioner in which a warm air heated by a heater core and a cold air by-passing said heater core are mixed at a controlled ratio to provide conditioned chilled air and conditioned warm air, the conditioned chilled air being discharged to an upper part of a passenger compartment through an upper air outlet while the conditioned warm air is discharged to a lower part of the compartment through a lower air outlet, comprising: a main chilled air passage means and a sub-chilled air passage means for by-passing said heater core; an evaporator upstream of both of said main chilled air passage means and said sub-chilled air passage means; a main warm air passage means and a sub-warm air passage means for distributing warm air coming out of said heater core at a suitable ratio; a first duct means for mixing chilled air from said main chilled air passage means and the warm air from said sub-warm air passage means, said first duct means being adapted to introduce the mixture to said upper air outlet; a second duct means for mixing the chilled air from said sub-chilled air passage means and the warm air from said main warm air passage means, said second duct means being adapted to introduce the mixture to said lower air outlet; a first air mix door for controlling the ratio between the flow rate of chilled air introduced into said heater core and the flow rate of chilled air flowing into said main chilled air passage means, said first air mix door being on the inlet side of the heater core and disposed at a branching point of the main chilled air passage means and a passage for air flowing into the heater core and reciprocally controlling an opening area of the main chilled air

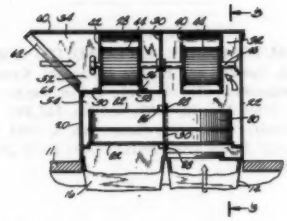
passage means and an opening area for the heater core from zero to maximum; and a second air mix door for controlling the ratio of mixing of the chilled air flowing from said sub-chilled air passage means into said second duct means and the warm air flowing from said main warm air passage means into said second duct means, said second air mix door being on the outlet side of the heater core and disposed at a meeting point of the main warm air passage means and the sub-chilled air passage means and reciprocally controlling an opening area of the main warm air passage means and an opening area of the sub-chilled air passage means from zero to maximum.

4,513,809

ENERGY RECOVERY VENTILATOR

Steven L. Schneider, Madison, and Konstantins Dravnieks, Thiensville, both of Wis., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Jan. 3, 1983, Ser. No. 455,042
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—54 **5 Claims**



1. An energy recovery ventilator mounted on a roof and connected to the outlet of an exhaust air duct of a building ventilation system and to the inlet of an air supply duct of a building ventilation system, the energy recovery ventilator including

a housing including an exhaust air chamber and a supply air chamber, said exhaust air chamber and said supply air chamber being separated by a divider wall defining a generally vertical plane,

a circular heat transfer wheel positioned in said housing, a portion of said heat transfer wheel being housed in said exhaust air chamber and a portion of said heat transfer wheel being housed in said supply air chamber,

means for causing rotation of said heat transfer wheel about a central vertical axis of rotation,

exhaust means for causing exhaust air to pass through said exhaust air duct and through said heat transfer wheel and to be exhausted from said housing, said means including an exhaust fan housed in said exhaust air chamber and positioned above said heat transfer wheel and for drawing air from said exhaust air duct upwardly through said heat transfer wheel and discharging the exhaust air from the housing, said exhaust fan including a first impeller shaft,

means for causing outside air to pass through said supply air chamber and said heat transfer wheel into said air supply duct, said means for causing outside air to pass through said supply chamber including a supply air fan housed in said supply air chamber and positioned above said heat transfer wheel and drawing air into said supply air chamber and forcing said air drawn into said supply air chamber downwardly through said heat transfer wheel and into said air supply duct, said supply air fan including a second impeller shaft, said first impeller shaft and said second impeller shaft being joined together such that they can be driven by a common motor, and

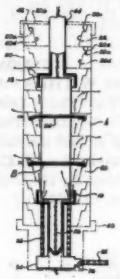
a motor drivingly connected to said first impeller shaft and to said second impeller shaft for driving said impeller shafts.

4,513,810

LOW GRAVITY EXOTHERMIC HEATING/COOLING APPARATUS

Richard M. Poorman, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,627
Int. Cl.³ F24J *1/00*
U.S. Cl. 165—61 **2 Claims**



1. Apparatus for heating a material sample in low-gravity environments by means of an exothermic reaction and thereafter cooling said sample, said apparatus comprising:

casing means having a generally closed interior;

sample support means carried within said casing means for supporting said sample;

exothermic heat means rapidly releasing heat surrounding said sample supported by said support means for heating said sample to a desired temperature;

said exothermic heating means including a plurality of individual segments of said exothermic material which can be ignited to give off heat, stacked upon one another and arranged to provide a desired temperature profile for heating said sample;

each said segment including a central recess therethrough defining an open core when said segments are stacked upon one another, in which core said sample material is disposed and surrounded, said recess being defined by a first generally vertical surface extending from a top surface of said segment and terminating in a generally horizontal ledge surface, and a second generally vertical surface extending from said ledge surface terminating at a bottom surface of said segment;

ignition means activating said exothermic heating means to release said heat;

cooling means quenching said sample at a desired cooling rate for controlled cooling following heating to said desired temperature; and

insulation carried within said casing means surrounding said exothermic heating means and said sample support means;

whereby the sample may be rapidly heated and thereafter cooled for controlled processing of said sample.

4,513,811

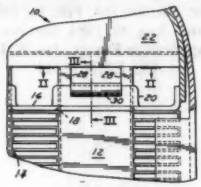
HEAT EXCHANGER

Thomas A. Lesniak, South Bend, Ind., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 9, 1983, Ser. No. 530,459
Int. Cl.³ F28F *7/00, 7/02*
U.S. Cl. 165—79 **3 Claims**

1. A heat exchanger comprising upper and lower headers, a plurality of aligned openings formed in the headers and each having outwardly extending flanges formed therearound, a plurality of tubes mounted between the headers and extended through said aligned openings and having end portions thereof

extended beyond said outwardly extending flanges, a pair of spaced vertical slits formed on each of opposite sides of said extended end portions of said tubes, said tube portions between



said vertical slits being curled toward and into engagement with said flanges, and solder applied between said tubes and the inner surfaces of said flanges and between the outer surfaces of said flanges and said curled tube portions.

4,513,812

HEAT SINK FOR ELECTRONIC DEVICES

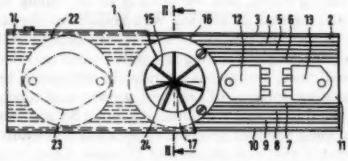
Georg Papst, St. Georgen; Guenter Wrobel, Villingen, and Ulrich Koletzki, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,458

Claims priority, application Switzerland, Jun. 25, 1981, 4189/81

Int. Cl.[3] **H01L** *23/36*

U.S. Cl. 165—80 B **13 Claims**



1. A heat sink for electronic devices comprising:

an elongated, rectangular plate;

a plurality of cooling ribs provided on one side of said plate, said ribs extending parallel to each other longitudinally of the plate and perpendicularly thereof;

a channel extending longitudinally in the center of said plate and separating said ribs into two longitudinally extending groups, said channel providing space for receiving and mounting electronic devices therein;

a recess formed in at least some of said ribs; and

a fan having a fan wheel, said fan being mounted on said plate with its axis perpendicular thereto and with the fan wheel in said recess.

4,513,813

AIR-COOLED STEAM CONDENSER

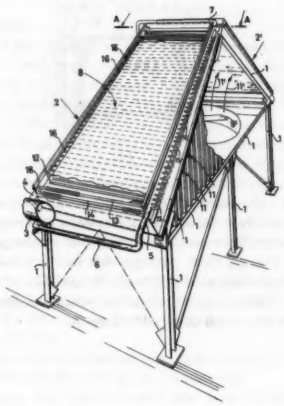
Alessandro Zanobini, Florence, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Feb. 1, 1982, Ser. No. 344,634

Claims priority, application Italy, Feb. 18, 1981, 19823 A/81

Int. Cl.[3] **F28B** *1/00, 3/00, 9/10;* **F24B** *1/06*

U.S. Cl. 165—111 **2 Claims**



1. An efficient air-cooled steam condenser which suppresses backflow and inhibits the formation of ice therein, comprising:

an inlet for steam, an inlet manifold connected at the lower end to said steam inlet for receiving and dispensing the steam, an outlet manifold spaced from said inlet manifold for collecting condensate from the steam at the bottom thereof, and a conduit connected to the top of said outlet manifold on the side of the condenser opposite that of the steam inlet for venting the uncondensed gases, said manifolds positioned at an incline and parallel to one another so that the condensate flows downwardly in said outlet manifold and the uncondensed gases flow upwardly in said outlet manifold, thereby condensing any uncondensed residual steam in the outlet manifold,

an air blower positioned below said manifolds for blowing a cooling air stream upwardly and through the space between said manifolds, and

a bundle of parallel, horizontal heat exchange tubes in the space between said manifolds, wherein each tube is a coil including three convolutions arranged horizontally and parallel to one another in consecutive rows relative to the direction of the cooling air stream and having a slope in the direction of said outlet manifold, and wherein each tube is connected to said inlet manifold by the convolution thereof which is the first to be contacted by said cooling air stream and to said outlet manifold by the convolution thereof which is the last to be contacted by the cooling air stream.

4,513,814

GLASS PIPE HEAT EXCHANGER

Dieter Wallstein, Bochum, Fed. Rep. of Germany, assignor to Langbein & Engelbracht GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Oct. 27, 1982, Ser. No. 436,964

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142485

Int. Cl.[3] **F28D** *7/00;* **F28F** *9/22, 19/00*

U.S. Cl. 165—134 R **7 Claims**

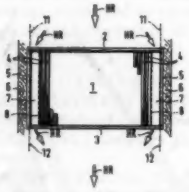
1. A heat exchanger, particularly for cooling of hot smoke

gases with aggressive components by clean gases to be heated, the heat exchanger comprising

elongated side walls each having two spaced ends;

bottom walls each arranged at a respective one of said ends of said side walls;

a plurality of glass pipes extending substantially parallel to each other and to said side walls and arranged so that a hot



smoke gas passes through said glass pipes in a first direction, while a cold clean gas passes in a second direction transversely to passage of said hot smoke gas; and

means forming flow passages for said hot smoke gases extending along said side walls in said first direction in said cold clean gas passage and preventing contact of said side walls only with said cold clean gas.

4,513,815

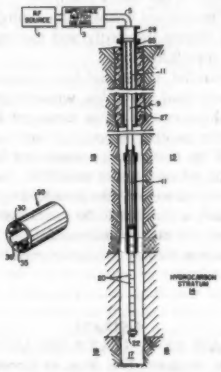
SYSTEM FOR PROVIDING RF ENERGY INTO A HYDROCARBON STRATUM

Herbert A. Rundell, and Kerry D. Savage, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,870

Int. Cl.³ E21B *43/24*

U.S. Cl. 166—57 **10 Claims**



6. Insulator means for use with an RF applicator comprising:

shell means having a predetermined length for surrounding a portion of an inner conductor of the RF applicator which emits RF energy so as to insulate that portion of the inner conductor, and

means for preventing the shell means from contacting the inner conductor.

4,513,816

SEALING SYSTEM FOR A WELL BORE IN WHICH A HOT FLUID IS CIRCULATED

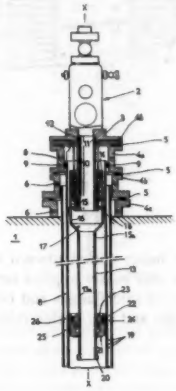
Miffre Hubert, Elancourt, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Continuation of Ser. No. 349,314, Feb. 16, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 646,036

Claims priority, application France, Jan. 8, 1982, 82 00172

Int. Cl.³ E21B *33/03*

U.S. Cl. 166—75 R **32 Claims**



1. A sealing system for a well bore of the type in which a hot fluid is circulated, comprising a wellhead unit, at least one tubing string which is capable of undergoing deformation under the action of the hot fluid circulating within said tubing string, at least one casing string provided with a perforated zone opposite to a permeable producing formation, said tubing string being housed within said casing string, a connecting and sealing assembly above the perforated zone operatively interposed between the casing string and the tubing string to support said tubing string, casing string support members for supporting and securing said casing string mounted at or connected to the wellhead unit, a hollow seal support having an upper end rigidly fixed to a stationary member of the wellhead unit and a portion telescopingly engaging in and opening into the top portion of the tubing string to form an annulus between said lower portion of said seal support and said top portion of said tubing string, said top portion of the tubing string being free and capable of moving with respect to the seal support with the bottom portion of said tubing string rigidly fixed to said connecting and sealing assembly placed near the bottom of the well bore, seal means operatively interposed between the telescoping portions of said seal support and tubing string in said annulus to seal the annulus formed by and between said telescoping portions upon the application of pressure to at least one end of said seal means, and pressure means to apply pressure to said at least one end of said seal means.

4,513,817

CASING BORE RECEPTACLE

Roger A. Weinberg, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

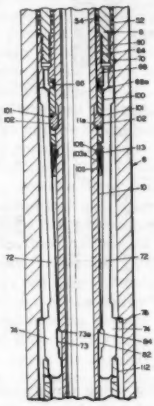
Filed Oct. 1, 1982, Ser. No. 432,210

Int. Cl.³ E21B *23/02*

U.S. Cl. 166—138 **19 Claims**

1. A packoff assembly for a casing bore receptacle defining a polished bore surface, comprising: an annular seal carrier having an abutting means for engaging said casing bore receptacle, external seal means on said annular seal carrier for establishing sealing integrity with said polished bore surface; a tubing connectable mandrel having a polished external cylin-

drical surface portion cooperable with said internal seal means; radially shiftable latching means carried on said annular seal carrier; expanding means on said mandrel for expanding said latching means into engagement with said casing bore receptacle; an axially shiftable support sleeve surrounding a portion of said mandrel; and positioning means for concurrently position-



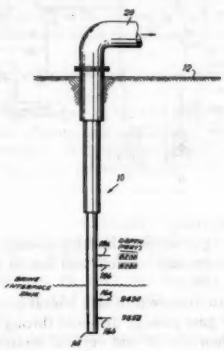
ing said support sleeve between said mandrel and said latching means when said latching means are engaged with said casing bore receptacle, and for locking said latching means in said engaged position, said mandrel being axially shiftable relative to said support sleeve when said positioning means are supported by said support sleeve rather than by said mandrel polished external cylindrical surface.

4,513,818

METHOD FOR REDUCING SCALE IN GEOTHERMAL SYSTEMS

Donald E. Michels, Whittier, Calif., assignor to Republic Geothermal, Inc., Santa Fe Springs, Calif.

Filed Mar. 23, 1983, Ser. No. 477,955
Int. Cl.³ E21B *41/02*
U.S. Cl. 166—244 C **7 Claims**



1. A method for reducing scale deposits in geothermal wellbores, surface piping, and heat energy extraction equipment along the geothermal fluid flow path wherein hot brine is removed from a well and used as a source of heat energy comprising the step of blending at least two naturally occurring hot brines in a single wellbore, each of said brines having interactive chemical qualities which when mixed reduces the quantity of residual, scale-forming constituents of the brine mixture from those of the separate, unmixed brines.

4,513,819

CYCLIC SOLVENT ASSISTED STEAM INJECTION PROCESS FOR RECOVERY OF VISCOUS OIL

Philip N. Islip, Plano, and Winston R. Shu, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1984, Ser. No. 584,186
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—263 **10 Claims**

1. A method for recovering oil from a subterranean, viscous oil-containing formation including a tar sand deposit, said formation being penetrated by at least one injection well in fluid communication with only the lower 50% or less of the oil-containing formation and by at least one spaced-apart production well in fluid communication with a substantial portion of the oil-containing formation, said injection well and said production well having a fluid communication relationship in the bottom zone of the formation, comprising:

(a) injecting into the formation via the injection well a predetermined amount of a mixture of steam and a solvent with the production well shut-in;

(b) shutting-in the injection well and recovering fluids including oil from the formation via the production well until the fluid being recovered comprises a predetermined amount of water;

(c) shutting-in the production well and injecting a predetermined amount of steam or hot water; and

(d) shutting-in the injection well and recovering fluids including oil from the formation via the production well until the fluid being recovered comprises a predetermined amount of water.

4,513,820

METHOD OF EXTRACTING AND REUTILIZING SURFACTANTS FROM EMULSIONS

Jim Maddox, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,579
Int. Cl.³ E21B *43/22, 43/40*
U.S. Cl. 166—266 **22 Claims**

1. A method for extracting and concentrating enhanced oil recovery surfactants into a relatively small volume surfactant-rich middle phase from produced emulsions comprising oil, water and surfactant, which comprises:

mixing a produced emulsion with an extracting compound solution of water containing about 0.3% to about 6.0% of an extracting compound selected from the group consisting of the alkali metal salts and ammonium salts of propyl benzene sulfonate, cumene sulfonate, ethyl benzene sulfonate, methyl ethyl benzene sulfonate, diethyl benzene sulfonate, methyl propyl benzene sulfonate, xylene sulfonate and dicyclopentadiene sulfonate; and

allowing the mixture of produced emulsion and extracting compound solution to separate into at least three phases, including a substantially surfactant-free and water-free crude oil phase, a relatively low volume middle phase containing surfactant, oil and water, and an oil-free aqueous phase.

4,513,821

LOWERING CO_2 MMP AND RECOVERING OIL USING CARBON DIOXIDE

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 3, 1984, Ser. No. 576,696
Int. Cl.³ E21B *43/16, 43/20*
U.S. Cl. 166—273 **10 Claims**

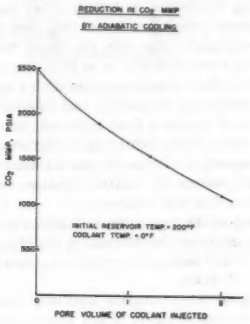
1. A method for the recovery of oil from a subterranean, oil-containing formation penetrated by at least one injection

well and at least one spaced-apart production well and having fluid communication therebetween, comprising the steps of:

(a) determining the minimum miscibility pressure at the temperature of said formation at which carbon dioxide will misicibly displace said formation oil;

(b) injecting a sufficient amount of coolant, substantially immiscible on first contact with said oil, into the formation via said injection well to lower the temperature of the formation between the injection well and production well to a temperature correspondig to a predetermined lower CO_2 minimum miscibility pressure;

(c) injecting a fluid into said formation to pressurize said



formation to a pressure at least equal to the predetermined lower CO_2 minimum miscibility pressure of step (b) at which miscibility exists between said carbon dioxide and said oil;

(d) injecting into said formation via said injection well a slug of carbon dioxide at said pressure of step (c) in an amount sufficient to establish a miscible transition zone of said slug with said formation oil;

(e) injecting a drive fluid into said formation via said injection well to drive the carbon dioxide and oil through the formation towards said production well; and

(f) recovering oil displaced by the carbon dioxide from the formation via the production well.

4,513,822

ANCHOR SEAL ASSEMBLY

Bruce Gilbert, Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.

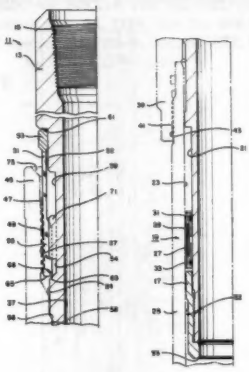
Filed Jun. 9, 1983, Ser. No. 502,829
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—382 **3 Claims**

1. A method of anchoring a string of production tubing within the bore of a packer to provide a seal between the packer bore and the production tubing, comprising the steps of:

providing a collet carrying tubing sub formed from a single piece of tubular conduit to eliminate potential leak paths, said tubing sub having an upper internally threaded connecting end for connection within a tubing string extending from the well surface, a collet receiving recess formed within the exterior surface of said tubing sub of lesser relative external diameter than said upper connecting end, and a lower end;

providing a threaded collet for circumscribing a portion of the exterior of said tubing sub, said collet having a collet base and externally threaded collet fingers for matingly engaging a threaded interior surface within said packer bore;

installing said collet on the exterior of said tubing sub by sliding said collet base first over said tubing sub lower end and expanding said collet fingers radially outwardly until said collet fingers are received within said recess, said tubing recess having a shoulder area at one end thereof for contacting said collet base and having a ramp area at the opposite end thereof for contacting said collet fingers, said collet being freely received within said recess prior to engaging said packer bore; and



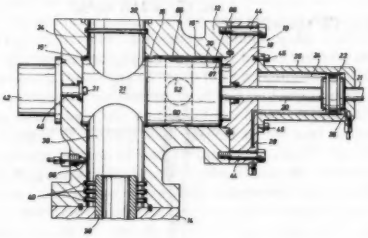
stabbing said tubing string downwardly into said packer bore whereby said collet base contacts said tubing recess shoulder area and said threaded collet fingers ratchet into engagement with said threaded interior surface to anchor said tubing within said packer bore.

4,513,823

CYLINDRICAL GATE VALVE APPARATUS AND METHOD

Joseph H. Hynes, Houston, and Charles D. Morrill, Humble, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Nov. 4, 1983, Ser. No. 549,201
Int. Cl.³ E21B *33/02, 43/12;* F16K *31/00*
U.S. Cl. 166—386 **18 Claims**



1. A valve comprising,

a housing having a vertical housing passage and a lateral housing passage, said vertical and lateral passages intersecting each other,

a cylindrical gate disposed in said lateral passage, said gate having a first gate passage disposed through it of a diameter smaller than that of said vertical housing passage,

means for laterally moving said gate within said lateral passage between two lateral positions:

a first lateral position where said gate is in the intersection of the vertical housing passage and the lateral housing passage, and

a second lateral position where the gate is out of the intersection of the vertical housing passage, thereby allowing full diameter access through the vertical housing passage, and

means for angularly rotating said cylindrical gate when it is in the first lateral position for angularly orientating said gate between at least two angular positions:

a first angular position where said first gate passage is coaxial with said vertical housing passage thereby allowing fluid flow from a lower portion of the vertical housing passage to an upper portion of the vertical housing passage via the first gate passage, and

a second angular position where a portion of said gate having no passage through it prevents upward fluid flow from a lower portion of the vertical housing passage via said gate passage.

16. In a well having a wellhead to which is attached a safety valve housing having an upper vertical housing passage and a lower vertical housing passage, the lower passage communicating with the wellhead, and each of the upper and lower vertical passages being open to a lateral passage in the housing, a laterally movable cylindrical gate disposed in said lateral passage, said gate having a first gate passage disposed through it of a diameter smaller than that of said vertical upper and lower passage, and means for laterally moving said gate within said lateral passage between a first lateral position where said gate is in the intersection of the upper and lower vertical passages and the lateral housing passage and second lateral position where the gate is out of the intersection of the vertical housing passage, and means for angularly moving said gate when in the first lateral position to a first angular position where said first gate passage is aligned with said upper and lower vertical housing passages or to a second angular position where said first gate passage is rotated substantially ninety degrees from the first angular position, the housing having a blowout preventer removably attached to the upper part of the housing with the vertical flow path of the blowout preventer communicating with the upper vertical housing passage of the safety valve, the diameter of the vertical flow path of the blowout preventer being substantially the same as or greater than that of the upper and lower vertical housing passages of the safety valve,

a method for controlling the well during installation of production tubing and a Christmas tree comprising the steps of,

setting tubing in the well through the blowout preventer and upper and lower vertical housing passages while the cylindrical gate is in the second lateral position,

laterally moving the gate to the first lateral position,

angularly moving the gate to the second angular position until the vertical fluid flow path to the upper vertical housing passage from the tubing is closed vertically,

removing the blowout preventer from the upper part of the housing,

installing a Christmas tree to the upper part of the housing, and

angularly moving the gate to the first angular position where the first gate passage completes the vertical flow path from the tubing in the wellhead below to the Christmas tree above the safety valve housing.

4,513,824

FLEXIBLE HORSESHOE

Donald F. Ford, 2011 D Sierra Rd., Concord, Calif. 94518

Filed Nov. 18, 1983, Ser. No. 553,274

Int. Cl.³ A01L *3/02, 5/00*

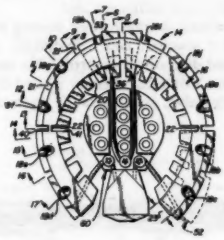
U.S. Cl. 168—4 **4 Claims**

1. An improved horseshoe for mounting on the hoof of a horse comprising:

a molded base, formed of a plastic material, for providing contact surface between the hoof and the ground;

a plurality of outer slot portions formed along a first surface of said base for supporting the hoof, each of said outer slot portions having a bumper lip for snugly fitting against the front of the hoof, with said plurality of outer slot portions spaced to allow the bending of the horseshoe to conform to the shape of the hoof while the lip molds the horseshoe to the hoof during the fastening of the horseshoe to the hoof;

a plurality of inner slot portions supporting the hoof spaced to allow the bending of the horseshoe to conform to the shape of the hoof; and,



a flex joint comprising a narrowed section of said base for allowing the horseshoe to flex with the hoof upon impact with the ground.

4,513,825

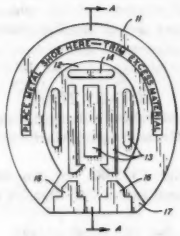
HORSESHOE FULL PAD

William Murphy, 19 Sherman Ave., Exeter, N.H. 03833

Filed Jan. 23, 1984, Ser. No. 573,063

Int. Cl.³ A01L *7/02*

U.S. Cl. 168—12 **8 Claims**



1. A horseshoe and pad affixed to a horse's hoof comprising a metal horseshoe having an open central portion and a cushioning full pad interposed between the hoof and the shoe, said full pad being of a molded foamed energy absorbing elastomeric plastic having a tough outer skin on both sides and a more resilient lower density core and being a sheet trimmed to said hoof, said sheet having on the turf side an integral central raised portion with stabilizer bars rising approximately to the height of said metal horseshoe.

4,513,826

HYDRAULIC CONTROL ARRANGEMENT FOR ACTUATING LIFTING MECHANISM OF AN AGRICULTURAL MACHINE

Werner Steprath, Dormagen, and Dieter Weigle, Urach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,969

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209396

Int. Cl.³ A01B *63/112*

U.S. Cl. 172—7 **21 Claims**

1. A hydraulic control arrangement for actuating a lifting mechanism of an agricultural machine, comprising

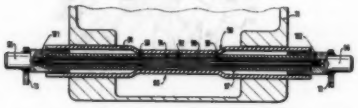
a hydraulic motor arranged to lift and lower at least one member of a lifting mechanism;

a hydraulic pressure medium source;

a directional control valve arranged to control said hydraulic motor;

a structural element having a bending elasticity arranged so that forces transmitted from said lifting mechanism member in a machine housing are at least partially transmitted via said structural element and the latter is bent when these forces are sufficient; and

a hydromechanical transformer having two parts movable relative to one another, and a hydraulic control circuit for controlling said directional control valve and arranged so that bending of said structural element is used by said transformer as an adjusting valve, said hydraulic control circuit providing



a pressure medium stream from said pressure medium source through said transformer, said structural element being directly formed by said parts movable relative to one another and influencing said pressure medium stream through said transformer, said parts including a first part which is hollow, has bending elasticity and is arranged to be exposed to the bending forces, and a second part which has less bending elasticity than said first part, is arranged so as to be free from exposure to the bending forces and is received in said first part, said second part being fixedly connected in at least one point with said first part, said first part having an end spaced from said at least one point, said second part having a free end formed with an adjustable throttle, said adjustable throttle being mounted in said end of said first part.

4,513,827

ROTARY TOOL

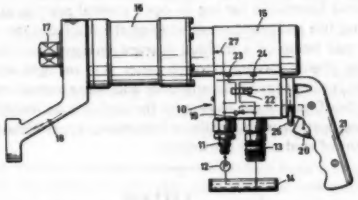
Oswald Dubiel, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Paul-Heinz Wagner, Much-Birrenbachshohe, Fed. Rep. of Germany

Filed Apr. 13, 1983, Ser. No. 484,436

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214842

Int. Cl.³ B25B *23/145*

U.S. Cl. 173—12 **25 Claims**



1. A rotary tool comprising an input shaft and an output shaft, overload clutch means between said input and output shafts for selectively drivingly connecting and disconnecting said input and output shafts, said overload clutch means drivingly connecting said input and output shafts upon relatively low load conditions of said output shaft to effect a predetermined drive ratio between said input and output shafts, first and second reduction gear means between said input and output shafts for selectively varying said predetermined drive ratio upon an increase load condition of said output shaft to decrease output shaft speed and increase output shaft torque, said overload clutch means drivingly disconnecting said input and output shafts upon an increase load condition of said output shaft and overrunning clutch means between said first and second reduction gear means for drivingly connecting said first and second reduction gear means upon said overload clutch means drivingly disconnecting said input and output shafts whereby said output shaft is driven through said first and second reduction gear means from said input shaft to thereby decrease output shaft speed and increase output shaft torque, said overrunning clutch means includes first and second overrunning clutch members coupled to the respective first and second reduction gear means, said first overrunning clutch member being in driving relationship to said input shaft through said first reduction gear means, said first and second overrunning clutch members being drivingly connected upon said input shaft speed being greater than said output shaft speed, said first and second overrunning clutch members have surface portions in generally spaced telescopic coaxial relationship with clutch elements disposed therebetween, a first of said surface portions being generally cylindrical, and a second of said surface portions having a plurality of flats whereby the location of said clutch elements relative to said cylinder and flats effects the engagement and disengagement of said first and second overrunning clutch members.

4,513,828

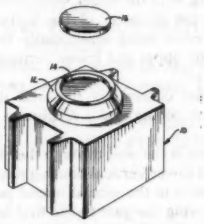
PILE DRIVING CAP BLOCK CUSHION ASSEMBLY

Cecil C. Chappelow, Jr., and Thomas J. Byerley, both of Johnson County, Kans., assignors to Conmaco, Inc., Kansas City, Kans.

Filed Mar. 8, 1983, Ser. No. 473,268

Int. Cl.³ B23B *45/16*

U.S. Cl. 173—139 **13 Claims**



1. A pile driving assembly comprising:

a helmet adapted to be placed in overlying relationship to the pile being driven,

said helmet having a cone portion for receiving a cushion material; and

a fiber filled thermoplastic cushion material in particulate form disposed in said cone portion,

said cushion material undergoing partial deformation during a pile driving operation to form an encapsulated liquid center within said helmet,

whereby pile driving forces are transmitted through said thermoplastic material while some shock forces are absorbed by said material.

4,513,829

CHIP RELIEF FOR ROCK BITS

J. Randall Coates, Tonkawa, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 337,929, Jan. 8, 1982,. This application Jan. 9, 1984, Ser. No. 569,060

Int. Cl.³ E21B *10/18*

U.S. Cl. 175—339 **2 Claims**

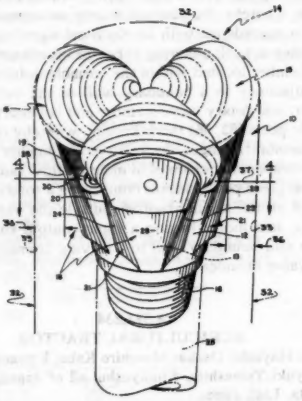
1. An air circulation, air lubricated, roller cone rock bit comprising:

a rock bit body having a first cutting end and a second threaded pin end, said body forming a chamber therein,

said chamber communicates with said circulation air through an opening formed in said second pin end, said pin end being connected to a drill string,

at least a pair of legs extending from said bit body, each leg forming a shirttail portion and a bearing, each bearing serves to support a roller cutter cone at said first cutting end of said bit, cutting elements adjacent the largest diameter of each roller cone form a gage of a borehole in a formation,

at least one nozzle formed in said bit body in communication with said chamber, said nozzle directs air past each roller cone into said borehole to lift detritus material out of the bottom of the borehole, and



relief means formed by said legs, said relief means serves to pass said detritus material from the bottom of said borehole by the rock bit body and out of said borehole by providing an annular space between an outer surface of said legs and walls formed by said borehole, said annular space, in a plane perpendicular to an axis of said bit, about adjacent an exit end of said at least one nozzle, is thirty-five percent or more of the area formed by said borehole through said plane, said annular space progressively enlarges in perpendicular planes between said exit end of said at least one nozzle and a shoulder formed in said bit body, said shoulder forms a thread termination base end for said second threaded pin end of said rock bit.

4,513,830

METHOD AND ARRANGEMENT FOR DETERMINATION OF VALUES RELATING TO THE MASS OF A FLOW OF MATERIAL

Sven-Eric Persbeck, Torslanda, and Bert Almqvist, Göteborg, both of Sweden, assignors to Utvecklingsaktiebolaget Teccon, Torslanda, Sweden

Filed Jan. 13, 1983, Ser. No. 457,586

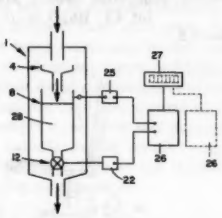
Claims priority, application Sweden, Jan. 20, 1982, 8200284

Int. Cl.³ G01G *17/00, 11/14, 13/24*

U.S. Cl. 177—1 **4 Claims**

1. A method for determining the weight of a fluid material by passing the same through a weighing apparatus having a single container provided with inlet and outlet means for receiving and discharging said material, comprising:

continuously directing said material into said container and periodically discharging the same from said container at a rate which exceeds the flow of material into said container, thereby to create successive collecting and discharge periods and causing the amount of said material in said container to change during collecting and discharge periods between a maximum weight at the end of each collecting period and a minimum weight at the end of each discharge period, weighing said container and its contents during collecting periods to obtain a series of values related to the increase of weight of the material during said periods and the length of said periods and the weight at the end of said periods immediately before the



start of said discharge period, and converting signals corresponding to said related values to determine the total weight of fluid flow by adding estimated weight values during said discharge periods on the basis of increased weight values at the end of said collecting periods.

4,513,831

WEIGHING SYSTEM

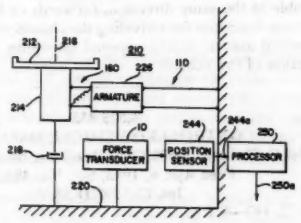
Shih-Ying Lee, Lincoln, and Dennis K. Briefer, Berlin, both of Mass., assignors to Setra Systems, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 265,088, May 19, 1981, Pat. No. 4,382,479. This application May 9, 1983, Ser. No. 492,942

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ G01G *23/06, 21/10, 3/14, 3/08*

U.S. Cl. 177—189 **19 Claims**



1. A weighing system comprising:

A. force input member for supporting an object-to-be-weighed,

B. a rigid armature member,

C. first linkage including means for coupling said armature and a reference member whereby said armature is constrained to motion substantially parallel to a reference axis, said reference axis being fixed with respect to said reference member,

D. mechanical means for coupling said force input member and said armature,

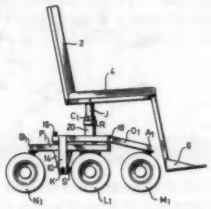
E. force transducer coupled between said armature and said reference member, said force transducer including a pair of complementary opposed surfaces having a mutual separation which is related to the force across said transducer, and

F. a position sensor for generating a signal representative of the separation between said complementary opposed surfaces of said force transducer.

4,513,832
WHEELED CHASSIS

Bo H. S. Engman, Sands Bruk, Sweden, assignor to Permobil AB, Timra, Sweden

Filed May 3, 1983, Ser. No. 491,012
Claims priority, application Sweden, May 3, 1982, 8202763
Int. Cl.³ B62D *61/10*
U.S. Cl. 180—6.5 **12 Claims**



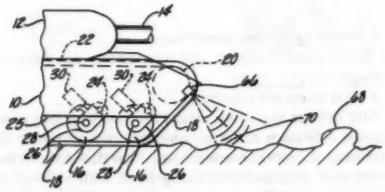
1. A maneuverable, motor-driven wheeled chasis, including a chassis structure carrying pairs of freely mounted support wheels separated in the longitudinal direction of the chassis, and a pair of drive wheels arranged between said support wheel pairs, characterized in that said chassis structure includes a first frame structure carrying a first pair of said support wheels and said pair of drive wheels, and a second frame structure pivotably connected to said first frame structure for movement in the vertical direction and carrying a second pair of said support wheels; said first frame structure including two parallel independently movably connected longitudinal members and said second frame structure similarly including two parallel independently movably connected longitudinal members connected at their ends to said first frame structure such that they are individually pivotable relative to it.

7. Chassis as claimed in claim 1, characterized in that means for driving the drive wheels are carried by the first frame structure and adapted such that the two drive wheels are drivable in the same direction, forwards or backwards, or in opposite directions for swiveling the chassis substantially about a vertical axis to enable optional alteration of the travelling direction of the vehicle.

4,513,833
CONTROLLED VEHICLE DAMPING

Daniel F. Sheldon, 23638 Oak, Dearborn, Mich. 48128

Filed Apr. 6, 1983, Ser. No. 482,694
Int. Cl.³ B62D *55/00*
U.S. Cl. 180—9.1 **5 Claims**

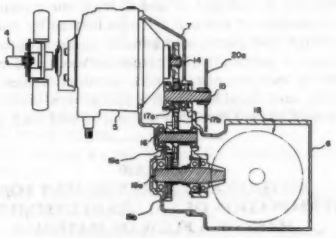


1. In a vehicle comprising a hull, a series of road wheels individually connected to the hull via swingable suspension arms, and a spring mechanism trained between each suspension arm and the hull to provide the vehicle suspension force: the improvement comprising separate unconnected hydraulic shock absorbers trained between the hull and selected ones of the suspension arms to exert dampener forces thereon during jounce motions of said suspension arms; each shock absorber comprising a liquid reservoir means **(48)**, a cylinder means **(34)** and a piston **(38)** reciprocably movable in the cylinder means; said cylinder means and piston defining a variable volume chamber **(46)** that is pressurized during wheel jounce motion and depressurized during wheel rebound motion; check valve means **(64)** permitting substantially unrestricted flow into the variable volume chamber during rebound motion; metering valve means **(54)** controlling hydraulic flow out of the variable volume chamber during jounce motion; said reservoir means communicating with the check valve means and metering valve means to supply liquid to the variable volume chamber or accept liquid from said chamber; the reservoir, chamber, and valve means constituting a closed liquid system; and electrically-energized power means for operating the metering valve means between a high flow position and a low flow position, whereby the suspension arm movement rate can be varied in accordance with an electrical signal applied to said power means; each metering valve means comprising a rotary valve member located within the variable volume chamber in close adjacency to a boundary wall of the variable volume chamber, said rotary valve member and boundary wall having alignable ports **(52, 56)** therethrough, whereby rotation of the valve member changes the relative alignments of the ports, with corresponding changes in metered flow rate; said electrically-energized power means comprising a rotary servo motor mounted on the shock absorber outside the variable volume chamber; said motor having a rotary output shaft extending through said boundary wall to a driving connection with the rotary valve member.

4,513,834
AGRICULTURAL TRACTOR

Tetsuaki Hayashi, Osaka; Masahiro Kabu, Kawachinagano, and Nobuyuki Yamashita, Kitakyushu, all of Japan, assignors to Kubota, Ltd., Japan

Filed May 11, 1982, Ser. No. 377,178
Claims priority, application Japan, Jul. 31, 1981, 56-115028[U]; Aug. 3, 1981, 56-115923[U]
Int. Cl.³ B60K *17/04*
U.S. Cl. 180—70.1 **6 Claims**



1. An agricultural tractor having front and rear wheels comprising:

an engine mounted at a front portion of the tractor;

a travelling transmission case mounted at a rear portion of the tractor and having an output shaft extending rearwardly therefrom;

differential case means for driving the rear wheels and for housing a differential drive shaft;

a driver's seat disposed above said differential case means; and

an elongated vertically oriented speed reduction case means for driving the rear wheels, said speed reduction case means operatively mounted between said travelling transmission case and said differential case means, said speed reduction case means housing a rear portion of said output shaft, a first transmission shaft, a second transmission shaft and a portion of said differential drive shaft;

said output shaft, first and second transmission shafts and

differential drive shaft each being arranged substantially vertically and serially;

said first transmission shaft including a portion extending rearwardly from said speed reduction case means and including brake means for braking said rearwardly extending portion of said first transmission shaft;

wherein said travelling transmission case, speed reduction case means and differential case means are rigidly interconnected by means defining a space between the front wheels and said differential case means for accommodating an implement therein; and

wherein said brake means includes a disc mounted on the rearwardly extending portion of said first transmission shaft and lever means having an elongated shape to apply a braking force to the disc, said brake means having a small dimension longitudinally of the tractor to define a utility space rearwardly of the brake means between the differential case means and the driver's seat for accommodating varied devices.

4,513,835

STEERING CONTROL APPARATUS

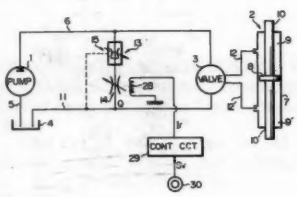
Masato Fukino, Yokohama; Tokiyoshi Yanai, Yokosuka; Hirotsugu Yamaguchi, Chigasaki, and Yutaka Aoyama, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 31, 1983, Ser. No. 480,820

Claims priority, application Japan, Apr. 30, 1982, 57-72699; Apr. 30, 1982, 57-72703

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—142 **9 Claims**



1. A fluid-operated steering control apparatus for a power-assisted vehicle steering system for a vehicle having a steerable road wheel and a manually driven steering wheel, comprising

a steering pressure pump;

a steering power cylinder which comprises a piston coupled to said steerable road wheel and which has first and second fluid chambers formed across the piston, the piston being axially movable by a differential fluid pressure developed between the first and second fluid chambers;

a steering pressure control valve intervening between said steering power cylinder and said steering pressure pump and operative to direct fluid under pressure from the steering pressure pump selectively to one of the first and second fluid chambers of the power cylinder and to drain fluid from the other of the fluid chambers at variable rates for developing a differential fluid pressure across said piston; and

fluid flow control valve means bypassing said pressure control valve and comprising

a valve member movable in first and second directions to provide increasing and decreasing the rate of bypass fluid;

solenoid-operated valve actuating means operative to actuate the valve member of the fluid flow control valve means to move in one of the first and second directions of movement thereof,

parameter detecting means for detecting a variable operational parameter of the vehicle and producing an output signal representative of the detected value of the operational parameter, and

a valve control circuit electrically connected to said valve actuating means and said parameter detecting means and comprising a plurality of signal generators each having stored therein a set of information representative of a predetermined relationship between said operational parameter and desired flow rates of fluid through the fluid flow control valve means, the respective relationships represented by the sets of information stored in said signal generators being different from each other, each of the signal generators being responsive to the output signal from said parameter detecting means and being operative to produce an output signal representative of a target flow rate of fluid through the fluid flow control valve means in response to the output signal from said parameter detecting means, said valve actuating means being operative selectively on the basis of one of the respective output signals from said signal generators.

4,513,836

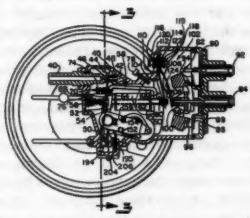
VEHICLE SPEED CONTROL

William A. Treadwell, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 50,237, Jun. 20, 1979, Pat. No. 4,346,775. This application Jun. 18, 1982, Ser. No. 389,656

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—177 **2 Claims**



1. A vehicle control mechanism having electrically operated means for rendering said control mechanism operable, switch means controlling the operation of said electrically operated means and having a normal condition and an actuated condition, and speed sensing means operable in response to the vehicle speed for operating said switch means, wherein the improvement comprises,

(a) a first elongated resilient switch leaf having one end mounted on a first support surface, said first switch leaf being flexibly mounted to said first support surface, said first switch leaf having an extension member extending outwardly therefrom;

(b) a first contact member mounted on a free end of said extension member,

(c) a second elongated resilient switch leaf having one end mounted on a second support surface, said second support surface being spaced from said first support surface, said second switch leaf being flexibly mounted to said second support surface;

(d) a second contact member mounted on said second leaf, and

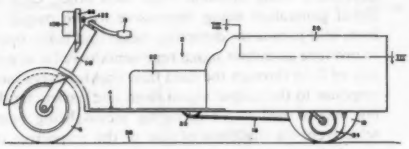
(e) whereupon said speed sensing means effects actuation of said switch means by deflecting a free end of said first resilient switch leaf toward a free end of said second resilient switch leaf until said first contact member abuts said second contact member, and thereafter simultaneously deflects both said switch leafs to effect a generally transverse wiping action between said first and second contact members while maintaining said abutting relationship therebetween.

4,513,837

MOTORCYCLE WITH OUTRIGGER WHEELS

Farley J. Archer, 508 Ida, Lansing, Kans. 66043

Filed Jul. 25, 1983, Ser. No. 516,919
Int. Cl.³ B62D 61/12
U.S. Cl. 180—209 7 Claims



1. A system for stabilizing a two-wheeled self-propelled motorcycle vehicle against lateral overturning, said vehicle having a steerable front wheel and a powered rear drive wheel normally disposed in the same vertical plane, said stabilizing system comprising:

a. a pair of outrigger wheels carried by the vehicle frame for vertical movement relative thereto and disposed respectively at opposite sides of said drive wheel in laterally outwardly spaced relation therefrom,

b. wheel extension means operable to move said outrigger wheels downwardly into engagement with the roadway surface when their use is desired, said wheel extension means comprising spring means biasing said outrigger wheels to their extended position, and

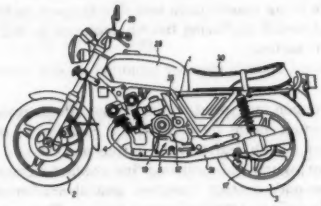
c. wheel retraction means powered by the vehicle drive system and operable when actuated to overcome and reverse the bias movement of said spring means, whereby to retract said outrigger wheels upwardly, said wheel retraction means constituting a fluid pressure system powered by the vehicle power plant and operable when actuated to overcome the bias of said spring means to retract said wheels, said fluid pressure system comprising a compressor operable when driven to deliver fluid under pressure to retract said wheels, an electric motor operable to drive said compressor and powered by the vehicle electrical system, an operating electrical circuit for said motor, and means operable to complete said motor circuit whenever retraction of said wheels is desired.

4,513,838

MOTORIZED TWO-WHEELED VEHICLE

Masaharu Tsuboi, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 350,350, Feb. 19, 1982, Pat. No. 4,462,482, which is a continuation of Ser. No. 101,110, Jun. 11, 1979, Pat. No. 4,331,212. This application Nov. 17, 1983, Ser. No. 552,953
Claims priority, application Japan, Sep. 25, 1977, 52-143214; Sep. 29, 1979, 52-129232
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ B60K 5/04; B62M 9/00
U.S. Cl. 180—219 1 Claim



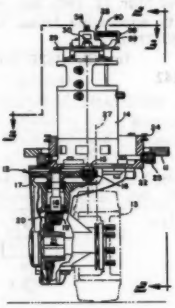
1. A motorized two-wheeled vehicle comprising a vehicle body frame having a front wheel and a rear wheel, an internal combustion engine positioned adjacent said front wheel having a crankshaft and a bottom portion, a transmission positioned rearwardly of the engine and driven thereby, characterized in that there is provided, between the crankshaft on the bottom portion of the engine and an input shaft on a front portion of the transmission, an intermediate shaft connected to the crankshaft in such a manner that the intermediate shaft is positioned above the crankshaft, and the intermediate shaft is provided on one end thereof with A.C. generator, on a middle portion thereof with a power transmission means from the crankshaft, and on a side portion thereof opposite said one end with a starter gear, and a starter motor connected to the starter gear is positioned at almost the same level with the intermediate shaft.

4,513,839

DISC BRAKE ARRANGEMENT FOR STEERING AND TRACTION UNIT

Robert A. Nieminski, and Walter R. Hinde, both of Philadelphia, Pa., assignors to Yale Materials Handling Corporation, Flemington, N.J.

Filed May 6, 1983, Ser. No. 492,113
Int. Cl.³ B60K 17/30
U.S. Cl. 180—253 6 Claims



1. A material handling vehicle comprising in combination, a vehicle frame supported by a plurality of wheels, at least one of said wheels comprising a drive-steer wheel carried on an assembly rotatably journaled in said frame about a vertical steering axis, said drive assembly comprising a base member, an electric motor mounted vertically on said base member, the axis of said motor shaft being offset from the steering axis, a speed reduction gear train interposed between said motor shaft and said wheel for driving the wheel, means for rotating said drive assembly about the steering axis to steer said vehicle, a brake disc fixedly mounted on said motor shaft for rotation in a horizontal plane, a bracket rotatably mounted on said motor shaft adjacent said disc, a caliper brake secured to said bracket and operably cooperating with said disc to brake said drive-steer wheel, means to actuate the caliper brake, and means for connecting said brake bracket to the vehicle frame for grounding the reaction of said brake to the frame and permitting limited rotational movement of said bracket and caliper brake at various steering positions of the wheel.

4,513,840

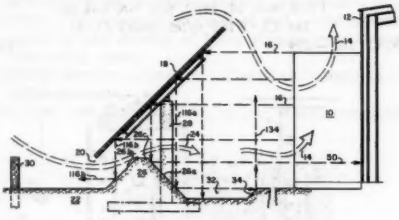
SOUND SUPPRESSION SYSTEM

Charles B. Johnson, Houston, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 13, 1983, Ser. No. 494,159
Int. Cl.³ B64F 1/26
U.S. Cl. 181—210 6 Claims

1. A system for suppressing the sound emanating from ground based air breathing machinery, comprising

a solid, sound reflective barrier having a height in excess of said machinery and being supported in a vertically spaced apart relationship with the ground, said barrier being of an unbroken planar configuration, inclined toward said machinery at an angle of approximately 45° from the vertical, and defining an airflow slot with the ground for permitting the flow of air therebetween;



a plurality of vertical supports secured to said barrier for preventing the movement thereof; and

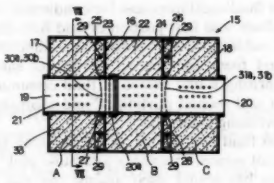
a dike located beneath said barrier and having a height in excess of the height of the lower end of said barrier for absorbing and reflecting any sound reflected downward therefrom, said dike running the entire length of said barrier.

4,513,841

MUFFLER FOR INTERNAL COMBUSTION ENGINES

Koji Shimoji, Okazaki; Suekiti Hangeisi, Toyota, and Keiji Itou, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 12, 1983, Ser. No. 541,282
Claims priority, application Japan, Apr. 1, 1983, 58-55286
Int. Cl.³ F01N *1/10*
U.S. Cl. 181—252 **10 Claims**



1. A muffler for absorbing noise created by an engine and transmitted therefrom through an exhaust pipe connected to the engine, comprising:

an outer cylinder;

end plates closing both ends of the outer cylinder and having openings therein;

inner pipes, being slidable relative to each other, inserted into the outer cylinder through the end plate openings and having a number of holes therein;

a plurality of separators for separating a space defined between the inner pipes and the outer cylinder, having outer flanges connected to the inner face of the outer cylinder and inner flanges connected to the outer faces of the inner pipes, the outer flanges having notches therein to provide for flexibility between the outer cylinder and the inner pipes; and

sound absorbing material in the space defined between the inner pipes, the separators and the outer cylinder.

4,513,842

CREDIT CARD HAIR COMB

Jerry J. Karlsberg, 4020 76th SE., Mercer Island, Wash. 98040

Filed Sep. 13, 1982, Ser. No. 417,129
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 R **4 Claims**

1. A credit card hair comb comprising:

a thin, rectangular sheet of relatively rigid, but slightly flexible material having length, width and thickness dimensions substantially the same as the length, width and thickness dimensions of a credit card;

a plurality of teeth located along one of the edges of said thin, rectangular sheet of material, the end teeth of said plurality of teeth being substantially wider than the other teeth of said plurality of teeth and the length of said teeth near the ends of said plurality of teeth decreasing, said decrease in length being such that the profile of the joints between the teeth and the body of said thin, rectangular sheet of material is curved near the ends of said plurality of teeth;

fairing regions formed at the joints between the teeth and the body of said thin, rectangular sheet of material for reducing discontinuities and strengthening said joints; and,

removal assistance means located along the edge of said thin, rectangular sheet of material opposite the edge along which said teeth are located, said removable assistance means comprising a first rectangular depression of substantially constant depth having a tactilely textured bottom located on one side of said thin, rectangular sheet of material along the edge of said thin, rectangular sheet opposite the edge along which said teeth are located and a second rectangular depression of substantially constant depth having a tactilely textured bottom located on the other side of said thin, rectangular sheet of material along the edge of said thin, rectangular sheet opposite the edge along which said teeth are located, said second rectangular depression being aligned with said first rectangular depression and sized the same as said first rectangular depression, said first and second rectangular depressions creating a ridge along the edge of said thin, rectangular sheet of material opposite the edge along which said teeth are located.

4,513,843

RAILWAY CAR RETARDER FOR SHUNTING PURPOSES

Sten H. Danieli, Göteborg, Sweden, assignor to Carlfors Bruk E Bjorlund & Co., Huskvarna, Sweden

Filed Dec. 1, 1982, Ser. No. 445,962
Int. Cl.³ B61K *7/02*
U.S. Cl. 188—62 **10 Claims**

1. A railway car retarder for shunting railway cars having an actuating member which when contacted by wheels of a passing railway car will retard the speed thereof when said speed exceeds a pre-determined value comprising:

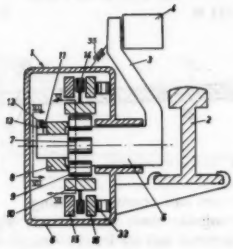
a housing member adapted to be mounted adjacent a railway track;

a shaft rotatably mounted in said housing;

an actuating member connected to said shaft and adapted to be engaged by a railway car wheel on which a railway car is moving;

a mechanical friction brake operatively mounted in surrounding relationship with respect to said shaft to produce a braking force when actuated; and

a speed-sensitive uni-directional clutch operatively interposed between said shaft and said brake so that said clutch will connect said shaft to said brake when the railway car



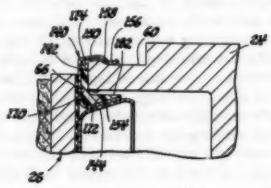
is moving in the direction in which the retarding is intended to be provided by the retarder and at a speed exceeding said pre-determined value.

4,513,844

DISC BRAKE SHOE RETAINER ASSEMBLY WITH INSULATION

Charles T. Hoffman, Jr., Waynesville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 7, 1982, Ser. No. 415,533
Int. Cl.³ F16D 65/84
U.S. Cl. 188—71.6 **1 Claim**



1. For use in a disc brake, a disc brake shoe retainer assembly for holding a shoe to a disc brake actuating piston and providing noise and heat insulation, the piston having an annular end with an end surface adjacent the shoe to which the retainer assembly is attached, said retainer assembly comprising:

an annular retainer body formed to provide a channel-like configuration adapted to fit over the piston annular end, the channel-like configuration being defined by an outer peripheral side surface having means thereon for gripping the piston in retaining relation against movement axially away from the piston and fitting over an outer peripheral portion of the piston, an inner peripheral side surface arranged to fit within the piston annular end in inwardly spaced relation therefrom and having means thereon for gripping a suitable part of the shoe in retaining relation against movement of the shoe axially away from the piston, and a bottom surface adapted to be positioned axially between the end surface of the piston annular end and the shoe;

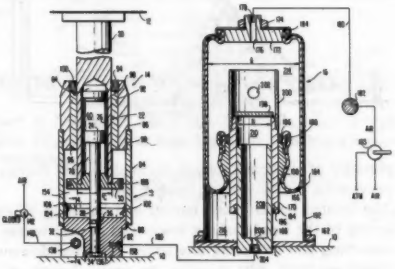
and insulation means received within said channel-like configuration and sufficiently coextensive with said bottom surface that the piston may transmit brake applying force from the end surface of the piston annular end through said insulation means and said bottom surface to the brake shoe when the disc brake is actuated, said insulation means being in surface engagement with said bottom surface and said inner peripheral side surface and engageable with the end surface of the piston annular end and radially spaced inwardly from the inner peripheral surface of the piston annular end when said retainer body is fitted to the piston.

4,513,845

SUSPENSION SYSTEM FOR A TILT CAB TRUCK

Robert Stephens, Brookfield, and Raymond Clark, Pewaukee, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Nov. 24, 1982, Ser. No. 444,207
Int. Cl.³ F16F 9/06; B60G 17/00
U.S. Cl. 188—299 **5 Claims**



1. A suspension system for a tilt cab truck, said suspension system comprising:

(a) a plunger ending in a first piston;

(b) a cylinder which contains a first chamber having a first end and a second end, said plunger being slidably and sealingly received in the first end of said cylinder and said first piston being received in said first chamber, said first chamber having at least two portions having different cross-sections, a first portion adjacent the first end of said cylinder which receives said first piston in a fashion which permits passage of a working fluid around said first piston and a second portion adjacent the second end of said cylinder which slidably and sealingly receives said first piston;

(c) first fluid conduit means for conducting working fluid to and from said first portion of said first chamber;

(d) second fluid conduit means for conducting working fluid to and from said second portion of said first chamber comprising a first means of fluid communication leading from said second portion of said chamber to a reservoir for working fluid; and

(e) third fluid conduit means for blocking said second fluid conduit means, forming a hydraulic lock, when said first piston has seated itself against the end of said second portion of said first chamber comprising a normally open valve in said first means of fluid communication, said valve being opened by fluid pressure when said first piston enters said second portion of said first chamber, being closed when said first piston is seated against the end of said second portion of said first chamber, and being selectively openable when it is desired to break the hydraulic lock formed when said first piston has seated itself against the end of said second portion of said first chamber.

4,513,846

MOTION SNUBBING DEVICE

Toshio Yajima, Atsugi, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Aug. 19, 1983, Ser. No. 524,847
Claims priority, application Japan, Aug. 27, 1982, 57/148776
Int. Cl.³ F16F 7/10
U.S. Cl. 188—380 **8 Claims**

1. A motion snubbing device provided between a supporting body and a supported body to permit low acceleration dis-

placements of the supporting and supported bodies relative to each other while restricting high acceleration displacements caused by a sudden external force, comprising:

a pair of cylindrical strut members capable of reciprocation relative to each other along the axial direction;

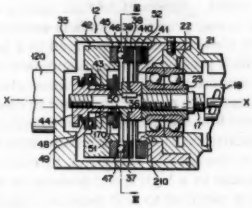
connecting means for connecting one end portion of one of said strut members to the supporting body and one end portion of the other strut member to the supported body;

motion converting means for converting relative reciprocation of both said supporting members into rotary motion;

a rotary shaft supported by one of said paired supporting members and capable of being rotated by said motion converting means;

a flexible member secured on said shaft and extending in the radial direction;

frictional wall means provided on one of said strut members



opposite to brake shoes provided on said flexible member on one side thereof;

an inertia mass provided so as to be freely rotatable on said rotary shaft opposite to said wall means and interposing said flexible member therewith;

resilient support means for supporting said inertia mass to be elastically movable in the axial direction of the shaft;

acceleration-responsive connecting means for connecting the flexible member and the inertia mass in such a manner as to rotate said inertia mass and said flexible member in unison in an ordinary condition and permit a delay of rotation of said inertia mass from that of said flexible member in response to a high acceleration displacement, thereby bringing said brake shoes provided on said flexible member into engagement with said frictional wall means in response to the delay motion of said inertia mass to restrict the rotation of said flexible member.

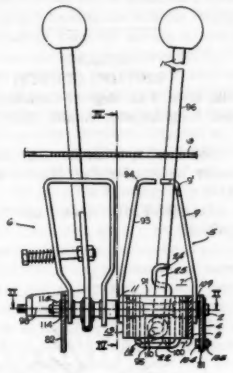
4,513,847

RANGE SHIFT AND PARK LOCK CONTROL

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 430,012
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **6 Claims**

1. A range shift and park lock control mechanism for a vehicle transmission comprising, a control console, a control lever, a range shift control member, a park lock control member, means pivotally mounting said control members on a common axis on said control console, a pivot bracket pivotally mounted on said control console on said common axis, means pivotally mounting said control lever on said pivot bracket for movement about a pivot axis lying in a plane normal to said common axis, said control members having confronting portions disposed at opposite sides of said control lever defining notches selectively engageable by said control lever whereby said gear shift mechanism and said park lock mechanism may be selectively engaged by said control lever so as to be operated one at a time, a gate plate on said control console defining a slotted opening through which said control lever extends including a pair of parallel slots for guiding said control lever during movement to effect range gear shift and park lock control, respectively, a transmission including a park lock mechanism and a gear shift mechanism, means connecting said park lock mechanism to said park lock control member, means connecting said gear shift mechanism to said range shift control member and biasing means operatively interposed between



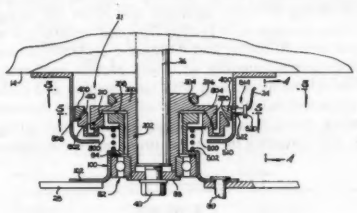
said pivot bracket and said control lever biasing the latter to pivot about said pivot axis toward said confronting portion of said range shift control member.

4,513,848

CLUTCH BRAKE ASSEMBLY FOR ROTARY LAWNMOWER

Ching P. Lo, Culver City, Calif., assignor to Amerosa Enterprises, Inc., Palos Verdes Estates, Calif.

Filed Jun. 15, 1981, Ser. No. 273,406
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 R **30 Claims**



1. A clutch assembly, for coupling and decoupling a rotary implement to a drive shaft, comprising:

a driving clutch member fixedly mounted to said drive shaft for rotation therewith;

a bearing having a first portion, secured for rotation with said driving clutch member and said drive shaft, and a second portion rotatable with respect to said first portion, said bearing secured against axial movement along said drive shaft;

a driven clutch assembly and said implement mounted for rotation with said second portion of said bearing;

said driven clutch assembly having a radially outwardly facing, combination conical wall and axial wall located radially inwardly of a corresponding and opposed radially inwardly facing combination conical wall and axial wall of said driving clutch member;

said driven clutch assembly being responsive to centrifugal force to move radially outwardly to cause said radially outwardly facing conical wall to engage said radially inwardly facing conical wall and slide axially and out-

wardly along the inwardly facing conical wall until the respective axial walls are engaged;

whereby said implement is centrifugally coupled with increasing frictional engagement for rotation with said drive shaft.

4,513,849

FRICTION CLUTCH

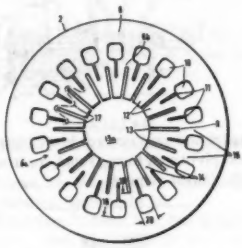
Wolfgang Reik, Bühl, Fed. Rep. of Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,717

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204533

Int. Cl.³ F16B *13/44*; F16F *1/32*

U.S. Cl. 192—70.27 **15 Claims**



1. A friction clutch, comprising a cover; a pressure plate; a pair of annular seats adjacent to said cover; a diaphragm spring disposed between said seats and having an outer marginal portion located radially outwardly of said seats and engaging said pressure plate, a plurality of holes inwardly adjacent said marginal portion, webs alternating with said holes, an annular tension spring inwardly adjacent said holes and integral with said webs, an annulus of prongs disposed inwardly of said seats and said tension spring and defining a centrally located opening, and slots alternating with said prongs, said slots having inner ends communicating with said opening and closed outer ends disposed radially inwardly of said holes; fastener means extending through said holes and securing said spring to said cover; and actuating means for tilting said spring between said seats.

4,513,850

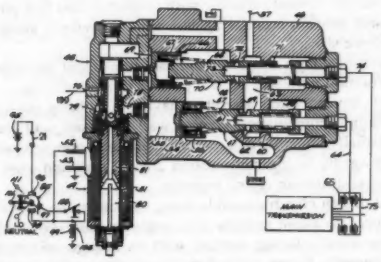
ELECTROHYDRAULIC POWER SHIFT TRANSMISSION SYSTEM

John R. Plate, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 9, 1983, Ser. No. 465,156

Int. Cl.³ F16D *25/10*, *25/11*

U.S. Cl. 192—3.58 **2 Claims**



1. In a vehicle having an operator's station, a clutch pedal at the operator's station and a change speed transmission having hydraulically operated high and low speed clutches, an electrohydraulic transmission control system comprising:

a source of pressurized fluid,

a source of electrical energy,

a fluid supply control valve connected to said source of pressurized fluid and having a shiftable flow control element operatively connected to said clutch pedal,

pilot operated low and high speed clutch valves connected in fluid receiving relation to said control valve and in fluid delivery relation to said low and high speed clutches, respectively, each of said valves including a flow control element, a fluid pressure chamber and a shiftable plunger in the pressure chamber operable to shift the associated flow control element when said chamber is supplied pressurized fluid,

a solenoid valve connected to said source of pressurized fluid and to said pressure chambers and including a shiftable valve element resiliently biased to a low speed position in which pressurized fluid is supplied to said pressure chamber associated with the low speed clutch valve flow control element to position the latter to direct pressurized fluid to said low speed clutch, said solenoid valve including an electric coil and an armature which shifts, when said coil is electrically energized, to move said shiftable valve element to a high speed position in which pressurized fluid is supplied to said pressure chamber associated with said high speed clutch valve flow control element to position the latter to direct pressurized fluid to said high speed clutch, and

an electric control circuit interconnecting said source of electrical energy and said solenoid valve for controlling operation of the latter including

an electric relay operated switch,

an electric relay operable upon electrical energization to close said relay operated switch,

a clutch pedal operated switch shiftable from a normally closed position to an open position when said pedal is operated, and

a manually operated speed selecting switch intermediate said clutch pedal operated switch and said relay operated switch, said speed selecting switch having a low speed position of adjustment in which the speed selecting switch is open interrupting flow of electricity to said relay and to said relay operated switch whereby the latter opens, said manually operated speed selecting switch having a high speed position of adjustment in which said relay is electrically energized to close said relay operated switch and electricity flows to said solenoid valve electric coil and to said relay operated switch and said manually operated speed selecting switch having a neutral position of adjustment in which flow of electricity is permitted therethrough to said relay operated switch, said relay operated switch opening to cause said valve element of said solenoid valve to occupy its low speed position when said clutch pedal operated switch is in its open position.

4,513,851

COIN COUNTING AND RELEASE MECHANISM

Wells F. Stackhouse, Leesburg, Fla., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.

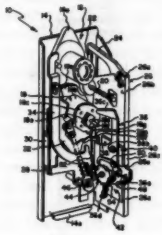
Filed Aug. 19, 1983, Ser. No. 524,537

Int. Cl.³ G07F *5/04*

U.S. Cl. 194—51 **18 Claims**

1. A multiple coin operated lock unit adapted for operation by a preselected number of coins of a given diameter and having a coin chute, a patron lock movable between unlocked and locked conditions upon sensing of a coin of said given diameter retained at a sensing station within said coin chute, a gauging surface adjacent said sensing station and retaining means adjacent said gauging surface and having coin gauging and release conditions corresponding to said unlocked and

locked conditions of said patron lock, said retaining means when in said gauging condition cooperating with said gauging surface to count the number of coins of said given diameter deposited in said coin chute for passage through said sensing station and to retain only a last deposited coin of said preselected number of coins of said given diameter in said sensing



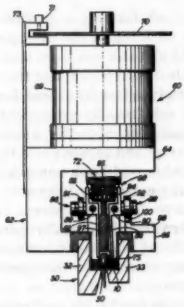
station, while permitting passage downwardly therebetween and through said sensing station of all previously deposited coins of said given diameter or of a smaller diameter of a like currency, and said retaining means when in said release condition releasing said last deposited coin for movement from said sensing station.

4,513,852

ORIENTING ASYMMETRICALLY SHAPED ARTICLES

Charles R. Fegley, Laureldale, and Joseph A. Tamashasky, New Philadelphia, both of Pa., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,581
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—399 **3 Claims**



1. Apparatus for reorienting at least one of a plurality of articles, each having a head and a body portion depending therefrom along a plane dividing the head asymmetrically wherein a first lateral portion has a first shape and a second lateral portion has a second shape, comprising:

means for guidably advancing the articles laterally to one another in a single file wherein the body portions are disposed with their respective dividing planes lying substantially along a common plane passing medially, longitudinally of a feed section of a track and each head has a first orientation when its first portion is facing in a first direction toward a first side of the track and a second orientation when its first portion is facing in a second, substantially opposite direction;

a turning station disposed in and containing a portion of the track, said station having means associated therewith for passing, blocking and turning the articles including:

a vertically extending housing having a lower portion rotatable in and containing the station track, there being wall segments adjacent the sides of said track with openings therein to accommodate blocking members;

a pair of blocking members suspended in the housing, such members having lower portions disposed at the station track, one in an active position in the track in the station and one in an inactive position out of said track such that an article entering the housing with the first orientation is guidably passed to a subsequent discharge section of the track and an article entering with the second orientation presents its first head portion having the first shape to the lower portion of the member in the active position and is blocked by said member from further advancement, said article also being so blocked that it further blocks advancement of the file before substantially any portion of a trailing article has entered the track in the housing;

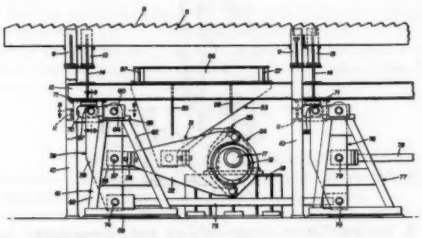
means for turning the housing with the station track and the blocked article therein sufficiently to engage a previously trailing end of the station track to the subsequent discharge track and for discharging thereto the turned article now having the first orientation, including on said wall segments of the housing, wedge portions which lead as the housing turns and engage arcuate portions of the wall segments against a trailing article to block the same from entering the station until the station is reset to pass or turn succeeding articles.

4,513,853

COOLING BED CONSTRUCTION

Otto H. Maier; James F. Seifert; John C. Ryder, all of Massillon, and William F. Grisez, Canton, all of Ohio, assignors to Maier Enterprises, Inc., Massillon, Ohio

Filed Sep. 27, 1982, Ser. No. 424,046
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—410 **12 Claims**



1. In an improved cooling bed construction of the type having a series of parallel, longitudinally horizontally extending notched beams, certain of which are fixed and certain others being reciprocally movable for advancing elongated bar material progressively along the fixed beams toward a discharge end, said improvement including: a single drive shaft extending transversely beneath the beams, reversible electric motor means for rotating said single drive shaft in forward and reverse directions, and first and second eccentric means mounted on the drive shaft and operatively connected to the movable beams for imparting reciprocal movement to the movable beams upon rotation of said drive shaft; the first eccentric means including a first disc eccentrically mounted on the drive shaft, a lever arm movably mounted on and reciprocally movable by the first disc, and a pivotally mounted bell-

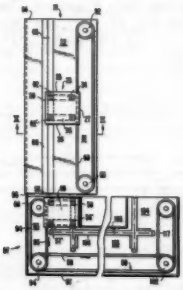
crank connected to and pivoted by the lever arm and operatively engageable with the movable beams for imparting a vertical raising and lowering motion on said movable beams upon rotation of the drive shaft; the second eccentric means including a second disc eccentrically mounted on the drive shaft and a lever arm movably mounted on and reciprocally movable by the second disc and operatively connected to the movable beams for imparting a horizontal reciprocating motion component to said beams upon rotation of the drive shaft; a series of notch means formed on the fixed and movable beams for holding the bars of material and for advancing said bars toward the discharge end upon reciprocal movement of the movable beams by rotation of the drive shaft in one direction and for turning the bars within their respective notch means without advancement upon rotation of the drive shaft in an opposite direction; and each of said notch means having a first surface extending downwardly in the forward direction of travel and a second surface extending upwardly in the forward direction of travel with said second surface having a smaller length and greater angle of slope than said first surface.

4,513,854

MACHINES FOR ASSEMBLING OR FOR MACHINING PARTS

Maurice Prodel, 153, rue de Verdun Carlepont, and Jacques Prodel, Rue de Cuts Carlepont, both of 60170 Ribecourt, France

Filed Mar. 3, 1983, Ser. No. 471,852
Claims priority, application France, Mar. 5, 1982, 82 03757
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 **30 Claims**



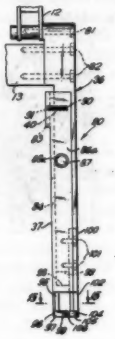
1. An installation for assembling and/or machining parts manually and/or automatically, the installation comprising a plurality of stations or modules through which part-carrying platens move along a path comprising successive horizontal path portions extending at right angles to one another, said platens being driven along successive path portions by successive belts which at least partially support the platens, wherein each module has as many belts as it has perpendicular path portions, with each belt comprising an endless loop having a driving portion and a return portion, said portions extending between a pair of vertical axis pulleys located in the vicinity of the ends of each path portion, with successive perpendicular endless loops being at different horizontal levels, whereby successive loops within a module share a common pulley having two loop-receiving grooves at said different levels, thereby enabling a single motor to drive all the endless loops within any one module.

4,513,855

SUBSTRATE ELEVATOR MECHANISMS

Ivan M. Fletcher, Clay Township, Hamilton County, and Gary W. Gladish, Buck Creek Township, Hancock County, both of Ind., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,347
Int. Cl.³ B65G *25/00, 65/02*
U.S. Cl. 198—473 **2 Claims**



1. An elevator mechanism for vertically transferring substrates between radial open-topped slots in a lower rotatable magazine and locations assigned to such substrates at the sides of an upper rotatable polygonal cage, said slots and locations being adapted by respective stepwise rotations of said magazine and cage about respective vertical axes therefor to by horizontally indexed transversely and laterally, respectively, past lower and upper transfer stations, respectively, and said mechanism comprising:

(a) a tray comprising:

(i) a frame adapted to hold substrates for carrying them between said slots and said locations;

(ii) a lug joined to the top of said frame nearer to one of its laterally opposite sides than the other,

(iii) a horizontal rod joined to said lug on one transverse side thereof and in vertically spaced relation from said frame,

(iv) and a tray tab forming a part of said rod which is salient from such lug in the direction opposite the saliency of said elevator tab from said stem and towards said other side of said frame, said tray tab being laterally and transversely offset from said lug and being on its underside of substantially cylindrical form,

(b) an elevator hook adapted to selectively engage and disengage with such tray and to move said tray vertically when engaged therewith, said hook comprising:

(i) a downwardly extending dolly arm,

(ii) a support arm disposed adjacent said dolly arm and extending downward generally parallel thereto, said support arm being pivotally coupled at its upper end to said dolly arm so as to be transversely rockable with respect thereto

(iii) a vertical stem fixed with, and projecting downward from, the lower end of said support arm,

(iv) a horizontal elevator bar fixedly joined to said stem on the front side thereof adjacent its bottom, such bar providing as part thereof an elevator tab horizontally salient from said stem, said elevator tab having an upper side laterally and transversely offset from said stem and in which is formed a horizontally extending substantially cylindrical groove adapted to receive and engage with the underside of said tray tab so as to move said tray vertically when said hook is so moved, the cylindrical groove on the top side of said elevator tab having a greater radius than that of the cylindrical surface of the underside of said tray tab so that said groove will

tend to retain said tray tab on said elevator tab in the event that said elevator tab becomes displaced from the horizontal,

(v) tray retaining means fixed to said dolly arm and including a retainer tab extending parallel to said elevator tab in frontwardly spaced relation therefrom, said tray retaining means providing between it and said stem and horizontal elevator bar a transverse gap laterally extending through said hook and adapted when opened wide to pass therethrough said lug of said tray,

(vi) spring means coupled between said dolly arm and rockable support arm and biasing the latter to urge said elevator bar in a direction which is towards said retainer tab and tending to close said gap therebetween so as to prevent separation between said tray and hook in the event of dislodgement of said tray tab from the upper side of said elevator tab; and

(c) endless belt conveyor means to which the upper end of said dolly arm of said hook is coupled, said conveyor means being adapted upon engagement of such tray tab with such elevator tab to convey said tray between said stations for purposes of transferring it and any associated substrate between said slots and said cage locations.

4,513,856

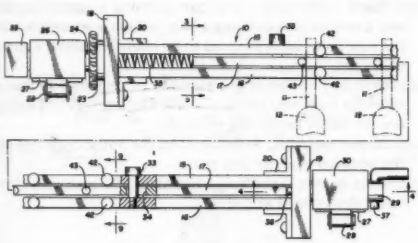
STICK TRANSPORT APPARATUS

Thomas F. Lowrance, 3601 Security St., Garland, Tex. 75040, and James B. Sharp, Edgewood, Tex., assignors to Thomas F. Lowrance, Dallas, Tex.

Continuation of Ser. No. 410,979, Aug. 24, 1982, abandoned. This application Jan. 17, 1984, Ser. No. 571,595

Int. Cl.³ B25G *25/00*

U.S. Cl. 198—695 **17 Claims**



1. A device for receiving and clamping a plurality of rod-like articles in fixed relationship comprising

an elongated housing having mounting means at each end; said housing having means on one side defining support surfaces, disposed in a common plane, for a plurality of longitudinally spaced, transversely oriented rod-like articles;

a plurality of longitudinally spaced abutment means projecting from said one side of said housing transverse to and beyond said support surfaces plane; each abutment means defining, with an associated support surface, a locating channel oriented transverse to said elongated housing for locating a single one of said rod-like articles in said transverse orientation;

an elongated clamping member mounted in said housing for relative longitudinal reciprocating movement; spring means urging said clamping member in one direction; cam means mounted on said clamping member for engagement by coacting cam means to move said clamping member in the other direction;

a plurality of longitudinally spaced clamping fingers projecting from said clamping member transverse to and beyond said support surface plane, each disposed in confronting coacting relation with one of said abutment means; and said spring means normally urging said clamping fingers toward respective abutment means, to clamp and confine rod-like articles in respective said locating channels;

said clamping members being movable against the force of said spring means to space said clamping fingers from respective abutment means to define lateral access to said locating channels.

4,513,857

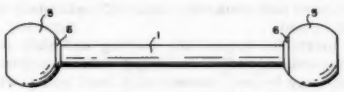
CONVEYOR LINKAGE

John M. Leach, P.O. Box 341, Port Jefferson, N.Y. 11777

Filed Aug. 4, 1982, Ser. No. 404,767

Int. Cl.³ B65G *19/14*

U.S. Cl. 198—716 **1 Claim**



1. In a bulk material handling conveyor of the type in which bulk material is moved through a casing by flights each formed of a pusher disc suitably supported on a carrier having a ball socket on each side of each disc to receive one ball of a linkage having a ball on each end interconnected by a rod to form a universal joint between each rod end and each flight to thus form an extra flexible chain which can be driven through the casing by a suitable drive, the improvement which comprises a conveyor linkage as aforesaid including a steel rod the material of which has been heat treated independently of any other elements as specified by the steel manufacture to increase its tensile strength to the maximum, a diametrically enlarged threaded area on each end of the rod leaving an unthreaded part of the rod in between, two balls as aforesaid, both of which have been heat treated separately from the rod and each having a centrally positioned opening therein threaded to fit a threaded area on the rod and one of the balls threaded on each of the threaded areas of the rod, the rod threaded areas having root diameters of the threads at least thirty percent larger than the diameter of the unthreaded part of the rod, thus providing a linkage having uniform maximum tensile strength throughout its total length even when the tension is applied to the linkage through the ball and rod connection, and further characterized in that the terminus of each threaded part of the rod nearest to the unthreaded part of the rod is rounded off to form an extension of the spherical surface of the ball threaded upon it and thus eliminating a potential catch point for the edge of the ball socket.

4,513,858

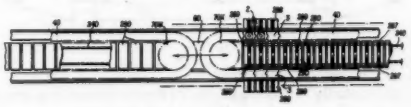
HORIZONTAL ACCUMULATOR

Theodore F. Fellner, and Leslie C. Talo, both of Neenah, Wis., assignors to Mapatent, N.V., Netherlands Antilles

Division of Ser. No. 264,845, May 18, 1981, Pat. No. 4,413,724. This application Aug. 30, 1983, Ser. No. 527,838

Int. Cl.³ B65G *21/14*

U.S. Cl. 198—812 **17 Claims**



1. A power drive conveyor system for transporting a plurality of articles, comprising:

a horizontally oriented section for accumulating the plurality of articles;

an endless conveying means for transporting the plurality of articles along a horizontal serpentine path of movement

on the horizontally oriented section from a source to a destination;

said conveying means having a substantially continuous article supporting surface for permitting said articles to be infed onto and discharged from said conveying means on a continuous basis while said conveying means is in motion;

horizontally operated slide assembly means for reversibly extending the length of the serpentine path of movement of the endless conveying means on the horizontally oriented section;

a first plurality of fixed pulley wheel means, arranged on one end of the horizontally oriented section, for moving the endless conveying means around alternate fixed pulley wheel means and said slide assembly means along the serpentine path of movement on said horizontally oriented section; and

drive means for sequentially moving said slide assembly means and said endless conveying means associated therewith away from or towards said fixed pulley wheels to change the length of said accumulating section;

said drive means including an infeed drive mechanism and a discharge drive mechanism working in conjunction therewith, at least one of said infeed drive mechanism and said discharge drive mechanism comprising:

a first pulley wheel which directs said conveying means in a first direction along said horizontally oriented section;

a second pulley wheel which directs said conveying means below said horizontal plane in a direction approximately opposite to said first direction;

a third pulley wheel which directs said conveying means back to said first direction along said horizontally oriented section;

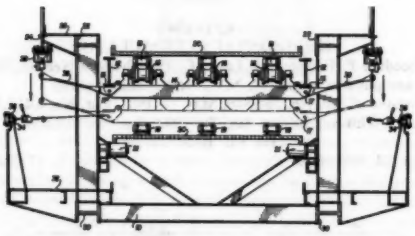
whereby the occurrence of slack is prevented in said conveying means and the required drive power is transmitted effectively and whereby the transported articles are accumulated on and discharged from the horizontally oriented section on a first-in, first-out basis, accumulated without any significant item back-pressure, and without any loss in orientation as delivered by the source and as required by the destination.

4,513,859

CONVEYOR WITH READILY REPLACEABLE ROLLER

Wallace H. Long, and Ralph Ruggiero, both of Tucson, Ariz., assignors to Duval Corporation, Houston, Tex.

Filed Nov. 19, 1982, Ser. No. 443,126
Int. Cl.³ B65G *39/10*
U.S. Cl. 198—842 **9 Claims**



1. A conveyor, comprising:

a substantially horizontal support frame comprising spaced first and second parallel horizontal members;

a roller-carrying bar extending between said first and second members, releasably secured to the undersides of said first and second members;

roller means secured on top of said roller-carrying bar;

an endless belt encircling said bar, and having a feed run supported by said roller means and a return run;

means for supporting said bar to allow said bar to be released from said first and second members and for lowering said bar so that said roller means is vertically clear of said first and second members; and

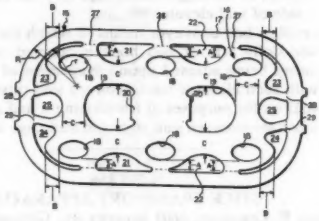
means for laterally moving said bar substantially perpendicular to said first and second members to move said roller means clear of said first and second members.

4,513,860

BOTTLE CARRIER

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 9, 1983, Ser. No. 530,567
Int. Cl.³ B65D *85/62, 71/02*
U.S. Cl. 206—150 **10 Claims**



1. A bottle carrier for carrying a plurality of bottles having a body portion and a neck portion and a closure which is attached to the neck of the bottle which comprises

a generally flat blank formed of a material that is flexible and elastic,

said blank comprising a first part defining a central portion and a second part defining a band which is severable from the first part and is adapted to be stretched about a group of bottles,

said first part comprising a plurality of openings in spaced rows for receiving the necks of the containers and engaging the necks below the closures,

said carrier including webs between the bottle openings and the periphery of the first part,

the stress on the webs being less than 550 p.s.i., the stress being determined as follows:

$$\text{stress} = \frac{\text{package weight (lbs.)}}{\text{wed width (in.)} \times \text{thickness (in.)}},$$

any radii in the band being at least $\frac{1}{4}$" or greater,

the average stretch ratio of the band between the length of the band and the length of the periphery of the bottles engaged by the band is about 8% to 14%.

4,513,861

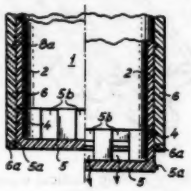
CARTRIDGE FOR CHEMICALS

Martin Baram, 13 Svanholmvej, DK-2660 Brondby-Strand, Denmark

Filed Oct. 18, 1982, Ser. No. 435,107
Claims priority, application Denmark, Oct. 19, 1981, 4600/81
Int. Cl.³ B65D *25/08*
U.S. Cl. 206—219 **12 Claims**

1. A cartridge for packaging, storing and dispensing chemical concentrates and similar materials, said cartridge being capable of submersion in any suitably dimensioned recipient container (B) by being inserted in a threaded neck (10,10*a*) thereof, said cartridge comprising a first cylindrical wall (6) with an outwardly extending flange (7) at its upper end, comprising also in overlaying relation a second cylindrical wall (1) extending in a frictionally sliding fit inside said first cylindrical wall (6) and having an integrated top wall (3) at its upper end and being generally open at its lower end, comprising further-

more a bottom piece (5 or 4,5) extending in a frictionally sliding fit inside said first cylindrical wall (6) abutting against said open lower end of said second cylindrical wall (2), comprising in addition fastening and sealing organs (5*a*, 6*a*, 8, 8*a*) inserted between on the one hand the first cylindrical wall (6) and on the other hand the second cylindrical wall (2) and said bottom piece (5 or 4,5) respectively, said organs being shaped and dimensioned to lock and maintain in sealed connection said cylindrical walls and bottom piece and thus to form a chamber (1) for the materials, said organs (5*a*, 6*a*, 8, 8*a*) being also shaped and dimensioned to permit a forced coaxial, downwardly oriented movement of said second cylindrical wall (2) and together with it of said bottom piece (5 or 4,5) relative to said first cylindrical wall (6) when the cartridge is inserted in said threaded neck (10, 10*a*) of said recipient container (B) and almost totally submerged therein with said flange (7) abutting against the upper rim of said neck (10, 10*a*) and when a fittingly threaded cap (H) belonging to said recipient container (B) is screwed onto said neck (10, 10*a*) pressing against said top wall (3) and thus said second cylindrical wall (2) together with said bottom piece (5, or 4,5) downwardly to create an opening at the lower end of said first cylindrical wall (6) for the discharge of the materials.



4,513,862

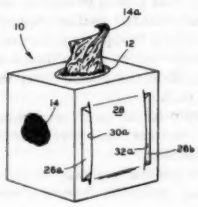
SCENTED TISSUE-DISPENSING CONTAINER

Peter Mallow, 450 Seventh Ave., New York, N.Y. 10123

Filed Mar. 18, 1983, Ser. No. 476,765

Int. Cl.³ B65D *5/08*

U.S. Cl. 206—233 **1 Claim**



1. A tissue-dispensing container of cardboard construction material of the type having walls including opposite side walls bounding a storage compartment and a stored supply stack of horizontally oriented absorbent paper tissues disposed in said storage compartment for removal one-at-a-time from the top of said stack, the improvement thereto comprising, in combination, a selected scent disposed in a porous cardboard packet of slightly smaller size than one said container side wall, and an operative position of said porous cardboard packet in physical contact with the edges of said horizontally oriented tissues which form the side of said absorbent supply stack of tissues so as to establish by said physical contact a seal against loss of fragrance from said container, said operative position consisting of an interposed position of said packet between said tissue supply stack and one said side wall so as to contribute to the transfer of the scent from said packet to said absorbent supply stack of paper tissues, said operative position being maintained by the projection of opposite sides of said packet through cooperating vertically oriented slits in said container side wall, whereby tissues removed from said container exhibit said scent by reason of said scent-absorbing adjacent position with said packet while said confined storage compartment for said tissues contributes to prolonging the time duration of the availability of said scent in said tissues.

4,513,863

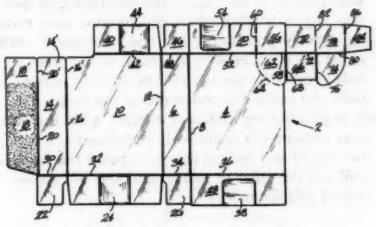
FLIP TOP DISPENSER CARTON

Joseph F. Schillinger, Fulton, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 18, 1983, Ser. No. 552,926

Int. Cl.³ B65D *85/10, 85/12*

U.S. Cl. 206—264 **6 Claims**



1. A carton formed from a one-piece paperboard blank, said carton comprising front and back walls interconnected by opposed side walls and said carton having a pivotable top closure comprising:

(a) a pair of wing panels, one of said wing panels being connected to one of said front and back walls by a rupturable interrupted cut score line, and the other of said wing panels overlying the other of said front and back walls;

(b) an outer closure panel foldably connected to each of said wing panels, said outer closure panel overlying one of said side walls;

(c) a plurality of top closure flaps foldably connected to said wing panels and said outer closure panel, said top closure flaps being overlapped and adhesively secured together; and

(d) at least one of said top closure flaps being foldably connected to a top cover flap which, in turn, is foldably connected to one of said front and back walls.

4,513,864

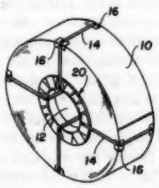
INTERIOR CORE PROTECTOR

Henry L. Liebel, Cincinnati, Ohio, assignor to Signode Paper Products Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 458,996, Jan. 18, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 598,220

Int. Cl.³ B65D *85/66*

U.S. Cl. 206—396 **9 Claims**



1. An interior core protector for positioning about the inner

circumference of a coil of material having a core to protect the material from damage, comprising:

a pair of rigid, preformed angles overlapping one another, and having first and second ends,

each said angle having a first leg and a second leg, said second leg having a plurality of spaced cuts therein extending from the angle to the outer edge thereof,

said first leg of each said angle being bendable whereby said first and second ends may be brought together to form an annulus,

the length of said angles being such that the circumference of said annulus is substantially at least as great as the circumference of the core,

said cuts in said second leg of each said angle widening on bending of said first legs permitting bending of said angles to conform to the circumference of the core,

said cuts in the second leg of one of said angles being offset with respect to the cuts in the second leg of the other of said angles so that when said interior core protector is operatively positioned in a coil of material each cut in either leg is covered by a portion of the other leg to provide protection for the coil of material around substantially the entire circumference of the core,

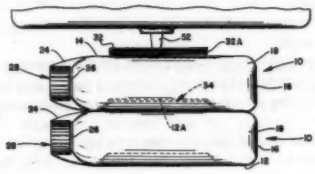
said angles having sufficient rigidity such that when said core protector is operatively positioned in a coil of material one of said second legs lies against the flat face of the coil and the other of said second legs lies against the said one of said second legs.

4,513,865

DISPOSABLE OIL DRAIN PAN AND CONTAINER COMBINATION

Edward R. Melzi, 3310 Ivanhoe La., Garland, Tex. 75042, and Arie Sharon, 1014 Wake Dr., Richardson, Tex. 75081

Filed May 20, 1983, Ser. No. 496,593
Int. Cl.[3] **B65D** *21/02, 25/40, 81/36;* **F16N** *31/00*
U.S. Cl. 206—508 **1 Claim**



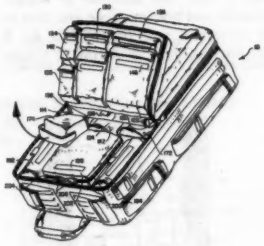
1. A container for collecting and storing a liquid such as motor oil and the like comprising a container body having a bottom panel and a top panel, said bottom and top panels being joined by sidewall panels thereby defining an interior reservoir, said top panel having a pour spout portion and a closure cap removably secured to said pour spout, and one of said sidewall panel members having a large diameter opening providing drainage access into said reservoir, and a large diameter closure cap removably secured to the sidewall portion of said sidewall panel member bounding said access opening, said large diameter closure cap projecting outwardly with respect to said sidewall panel member, said container wall having a sidewall panel member oppositely disposed with respect to the panel member in which the access opening is formed, said oppositely disposed panel member having a panel portion which is recessed inwardly toward said access opening, said recessed panel portion being generally conformed in depth and profile with said large diameter closure cap thereby defining a pocket whereby two or more of said container assemblies may be stacked together with the outwardly projecting closure cap of one container assembly being received in nesting engagement within the pocket defined by the recessed panel portion of another container assembly.

4,513,866

EMERGENCY MEDICAL PACK

Frank O. Thomas, 5167 South 600 East, Murray, Utah 84107

Filed Sep. 29, 1982, Ser. No. 428,103
Int. Cl.[3] **A45C** *11/00*
U.S. Cl. 206—570 **25 Claims**



1. A medical pack for storing medical equipment, the pack comprising:

a body having a generally planar back with a plurality of sides extending upwardly from the peripheral edges of said back;

lid means forming a front on said back, said lid means being attached along a portion of one end thereof to at least one of said sides of said body, and said lid means being configured so as to provide a plurality of operable positions, each permitting user access to substantially all materials contained within the pack;

a connecting means for detachably securing said lid means along its remaining edges to said sides of said pack; and

at least one drawer pocket means located in the pack, each of said drawer pocket means securing a pouch within the pack, each said drawer pocket means being formed as a receptacle for said pouch with at least one side of each said drawer pocket means being capable of being opened such that said pouch is removable from the drawer pocket means, said pouch having a handle mounted to one end thereof for use in removing said pouch from said drawer pocket means, said pouch providing storage for medical equipment such that the medical equipment stored in the pouch is accessible by opening the drawer pocket neans when the pouch remains within the pack or by pulling on the handle to slide the pouch from the drawer pocket means of the pack.

9. An emergency medical pack for storing and transporting medical equipment to treat a seriously ill or injured person, the medical pack comprising:

a body having a generally planar back with at least three sides extending upwardly from the peripheral edges of said back;

lid means forming a front on said pack, said lid means being attached along a portion of one end thereof to one of said sides of said body, said lid means being configured so as to have operable positions of at least a closed position and a partially open position, said lid means being foldable at at least one position along its width so as to place it in said partially open position, the pack occupying substantially the same amount of surface space when the lid is in the partially open position as when the lid is in the closed position and user access to substantially all materials within the pack being permitted when the lid is in the partially open position;

a connecting means for detachably securing said lid means along its remaining edges to said sides of said pack; and

a plurality of pockets for securing and organizing medical equipment stored in said pack, at least one of said pockets being attached to said lid means and at least one of said pockets being attached to said body, at least one of said pockets attached to said body having an opening substan-

tially adjacent to said foldable position of said lid means so as to permit user access into that pocket when said lid means is in the partially open position, all of said pockets being oriented in the same direction within said pack when said pack is completely closed such that the contents of all of said pockets are accessible when said pack is in either the fully open or the partially open position.

4,513,867

SORTER FOR GRAINS, PULSES AND THE LIKE

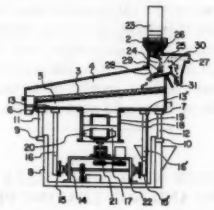
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,235

Claims priority, application Japan, Jun. 16, 1981, 56-93217; Sep. 19, 1981, 56-148018

Int. Cl.³ B07C *5/34*

U.S. Cl. 209—44.2 **6 Claims**



1. A sorter for granular material such as cereals, pulses and the like, the granular material comprising a mixture including complete grains each having a smooth outer configuration and liable to roll and damaged grains each having an irregular outer configuration, and said complete grains having a specific gravity higher than that of said damaged grains, said sorter comprising:

a movable frame;

a perforated sorting plate having a plurality of apertures therein and mounted on said frame for movement therewith and so as to be inclined longitudinally and laterally with respect to a horizontal plane in such a manner that said perforated sorting plate has a lower discharge end, an upper end, an upper side edge and an opposite lower side edge, said perforated sorting plate cooperating with said frame to define an air chamber below said perforated sorting plate, said apertures in said perforated sorting plate being in communication with said air chamber, said perforated sorting plate being corrugated so as to have a plurality of ridges having their respective ridgelines extending in generally parallel relation from said lower discharge end of said perforated sorting plate to said upper end thereof, said ridgelines being spaced from each other a distance at least equal to a size of each of said complete grains;

means drivingly connected to said frame for vibrating the same and therewith said perforated sorting plate;

means for supplying the mixture of complete grains and damaged grains onto an area of said perforated sorting plate adjacent to said upper end thereof, the inclination of said perforated sorting plate and the orientation of said ridgelines enabling the mixture of grains to flow down along said perforated sorting plate toward said lower discharge end thereof;

means disposed at said lower discharge end of said perforated sorting plate for receiving said grains; and

means for delivering pressurized air into said air chamber to cause the pressurized air to flow from said air chamber to a space above said perforated sorting plate through said apertures in the latter;

whereby, upon admission of pressurized air into said air chamber by said delivering means and upon vibration of said perforated sorting plate by said vibrating means, (a) said complete grains of the mixture supplied onto said perforated sorting plate are positively deflected toward said upper side edge of said sorting plate by said ridges on said sorting plate, and (b) said damaged grains of the mixture supplied onto said perforated sorting plate are, because of their high air resistance, subjected to upward force by the air flow through said apertures in said sorting plate, are floated up to a location further above the surface of said sorting plate than that of said complete grains, and are deflected toward said lower side edge of said sorting plate because of the higher specific gravity of said complete grains.

4,513,868

SORTING MACHINE

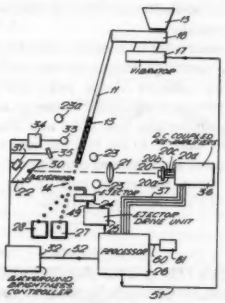
Michael J. Culling, Romford, and Benedict M. M. Deefholts, Kent, both of England, assignors to Gunson's Sortex Limited, London, England

Filed Oct. 14, 1981, Ser. No. 311,396

Claims priority, application United Kingdom, Jan. 19, 1981, 8101541; Jan. 19, 1981, 8101542

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—581 **28 Claims**



1. A sorting machine comprising:

viewing means for viewing objects to be sorted in a sorting zone to derive sorting signals indicative of whether light from at least a part of any object in at least one predetermined part of the spectrum is of an undesired character;

a background which is in the field of view of the viewing means;

feeding means for passing the objectis through the sorting zone and past the background so that the objects may be viewed against the background;

separating means, controlled by said sorting means, for effecting relative separation between any undesired objects which have been so viewed and the remaining objects;

means for periodically effecting temporary stoppages in the feeding means so as to stop the passage of the objects past the background;

examination means for periodically effecting an examination as to whether a predetermined relationship exists between said light in at least one predetermined part of the spectrum emanating from the background and the light in said part of the spectrum emanating from the average of the objects, said examination means comprising means for effecting, during passage of the objects across the background, a measurement representative of the average value of light which is simultaneously viewed by the viewing means both from the background and from the objects together, means for effecting, during a said stoppage a measurement representative of the value of light being viewed by said viewing means from the background alone, and means for comparing both said measurements to each other to determine whether said predetermined relationship exists; and

adjustment means, controlled by the examination means, for effecting, where necessary, an adjustment of the relative light coming from the background and the objects so as to tend to restore said predetermined relationship.

4,513,869

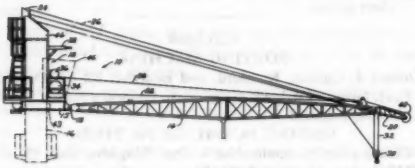
PEDESTAL CRANE MOUNTING SYSTEM

William E. Goudy, deceased, late of Gainesville, Tex. (by Ruth Goudy, administrator), assignor to Armco, Inc., Middletown, Ohio

Continuation of Ser. No. 348,028, Feb. 11, 1982, abandoned. This application May 17, 1984, Ser. No. 611,116

Int. Cl.³ B66C *23/84*

U.S. Cl. 212—175 **27 Claims**



1. In a crane having a vertical pedestal with an upper end and a gantry structure with a boom attached thereto, mounting and slewing apparatus, comprising:

a fixed vertical shaft extending upwardly from the upper end of the pedestal;

a yoke connectable to a gantry structure;

a bearing cartridge supported on said vertical shaft, for providing rotation of the yoke and a connected crane gantry structure about the pedestal; and

means for supporting said yoke and attached crane gantry structure relative to the bearing cartridge, and for lowering the yoke and attached crane gantry structure to rest in support upon the upper end of the pedestal to permit removal of the bearing cartridge.

4,513,870

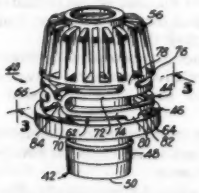
BOTTLE WITH A ONE-PIECE CORKING MEANS

Efim Zaltsman, Brooklyn, N.Y., assignor to Monarch Wine Co., Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 223,894, Jan. 9, 1981, abandoned, and Ser. No. 384,758, Jun. 3, 1982, Pat. No. 4,429,799. This application Feb. 3, 1984, Ser. No. 576,611

Int. Cl.³ B65D *1/02, 55/16*

U.S. Cl. 215—31 **11 Claims**



1. For use with a bottle containing pressurized, carbonated, water-based, liquid contents and having: a body portion; an elongated neck portion; and a mouth portion, said neck portion having at least one circumferential squat, annular flange adjacent to the mouth portion;

a corking unit of a molded one-piece elastomeric plastic construction, said corking unit comprising:

(a) an elongated, generally circular, cylindrical sleeve, insertable with frictional engagement through the mouth portion into the neck portion of the bottle;

(b) a head connected to the sleeve;

(c) an annular, circumferential ring, shaped for reception on the neck portion of the bottle above the annular flange, said ring being positioned and spaced below the head as molded and being concentric with the sleeve, said ring being located above the flange upon initial reception of the sleeve on the neck portion with the ring above the flange, the internal diameter of the ring being slightly less than the external diameter of the flange and the ring being expandable when mechanically pushed down over the flange in order to descend past the flange and constrict below the flange so as to be captively retained on the neck portion of the bottle below the flange; and

(d) at least one set of flexible elongated tethers constituting a pair of tethers, each tether of said pair having one end connected to the ring and the other end connected to the head, said tethers joining the ring to the head, the points of connection of the tethers of each pair to the head being spaced from one another and the points of connections of the tethers to the ring being spaced from one another, the tethers of each pair being in a folded state as molded and each tether having a length as molded substantially greater than the distance between its ends as molded, each tether including at least a pair of branches and a retroverted bend interconnected thereby, at least one retroverted bend of one tether on the set having its closed end facing and adjacent to the closed end of the retroverted bend of the other tether and joined thereto by an energy-absorbing link molded in one piece with the tethers, said link assimilating a portion of the force that would tend to propel the sleeve away from the neck portion of the bottle upon removal of the sleeve from said neck portion.

4,513,871

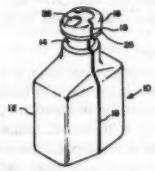
CONTAINER WITH INTEGRALLY FORMED NON-CORING AND NON-LEAKING PIERCING SITE

Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Health Care Concepts, Inc., Allamuchy, N.J.

Filed May 30, 1984, Ser. No. 615,214

Int. Cl.³ B65D *41/42*

U.S. Cl. 215—32 **5 Claims**



1. A blow molded sealed container of integral construction having a piercing site for penetration by a steel or plastic needle comprising:

a. a main body for containing or receiving a liquid;

b. a hollow neck portion extending from and communicating with the interior of said main body; and

c. hollow, fully enclosed main dome means formed on the opposite end of said neck portion communicating with the interior of said neck having a generally uniformly curved outwardly bulging shell of uniform thickness substantially circular in diameter greater than, and concentric with the central axis of, said neck, the outer surface of said shell having formed therein a needle penetration site consisting of a secondary dome axially offset from the center line of said neck and whose diameter is less than the diameter of said curved shell.

4,513,872

CONTAINERS

Cyril A. Bull, Mansfield, England, assignor to Metal Box, PLC, Reading, England

Filed Sep. 8, 1982, Ser. No. 416,039

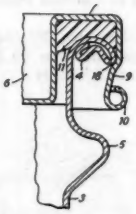
Claims priority, application United Kingdom, Nov. 19, 1981, 8134933

Int. Cl.³ B65D *1/16*

U.S. Cl. 220—74 **1 Claim**

1. A container comprising a container body and a lid, said container body comprising a bottom wall and an upwardly, outwardly flaring tubular side wall terminating at one end in an

external body curl defining the mouth of a body, said body curl having a first annulus or arcuate cross-section defined by wall portions extending radially curved upwardly, curved outwardly and curved downwardly from the side wall to define a convex external surface and a concave internal surface, a radially outermost folded portion turning radially inwardly and upwardly from an outermost periphery of said first annulus downwardly extending wall portion, a second annulus defined by wall portions extending radially upwardly, inwardly and downwardly from and relative to said radially outermost folded portion, said second annulus upwardly and downwardly extended wall portions defining an angle therebetween, said second annulus inwardly extending wall portion having an arcuate curved cross-section defined by a convex external surface and a concave internal surface, said first annulus concave internal surface having a radius of generation appreciably



greater than a radius of generation of said second annulus convex external surface, said second annulus convex external surface being disposed immediately adjacent to but spaced from the concave internal surface of the first annulus, a radially innermost folded portion turning radially upwardly and outwardly from said second annulus downwardly extending wall portion and being sandwiched between the radially downwardly extending wall portion of said second annulus and the upwardly extending wall portion of the first annulus, said lid having a closure panel, and an annular channel portion surrounding to closure panel, extending axially from the channel portion to a peripheral skirt terminating in an outwardly directed curl and a gasket fixed within the channel portion, said gasket being engaged with the external surface of the convex first annulus, and said outwardly directed curl of the skirt being crimped radially inwards under the body curl so that the radially outermost folded portion engages the skirt.

4,513,873

CAPACITOR CAN HOUSING, PROCESS AND APPARATUS FOR ITS MANUFACTURE

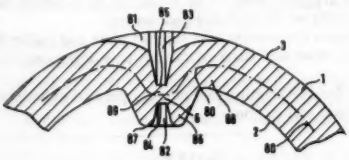
Rudolf Klaschka, 7896 Wutoeschingen 3, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,445

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138519; Jan. 22, 1982, 3201963

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—89 A **1 Claim**



1. A capacitor can housing comprising a can wall made of a ductile material with at least a circumferentially closed can side wall, means on said side wall defining a predetermined burst spot, said burst spot being a groove-shaped weakening of said can side wall formed by a deep drawn indentation extending inwardly of said can side wall, said burst spot having an outer indentation with a bottom surface and an inner indentation with a bottom surface, said outer indentation and said inner indentation being opposed to one another, the bottom wall of said inner indentation being disposed radially inwardly of the inner circumferential surface of said can side wall, said bottom surface of said outer indentation being circumferentially wider than said bottom surface of said inner indentation, said inner indentation having a generally wedge-shaped configuration.

4,513,874

PRESSURE RELIEF DEVICE FOR INTERNALLY PRESSURIZED FLUID CONTAINER

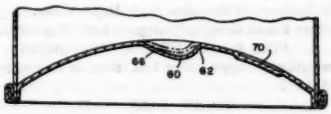
Walter J. Mulawski, Chelmsford, Mass., assignor to Sexton Can Company, Inc., Everett, Mass.

Continuation-in-part of Ser. No. 327,200, Dec. 3, 1981, Pat. No. 4,433,791, which is a continuation of Ser. No. 169,404, Jul. 16, 1980, abandoned. This application Jan. 25, 1984, Ser. No. 573,869

The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.

Int. Cl.³ B65D *51/16, 83/14*; F16K *17/14*

U.S. Cl. 220—89 A **12 Claims**



2. A pressure relief device for a container having a cylindrical side wall, said container being of a type adapted to contain fluid under pressure, said device comprising: an inwardly protruding generally concave metal closure element circumferentially joined to one end of said side wall, an integrally formed outwardly protruding central area in said closure element, said central area being partially circumscribed by a weakened line of reduced material thickness, said closure element having a structural integrity which reacts to an overpressurization of the fluid in said container by undergoing eversion which intitiates a fracture of the closure element along said weakened line, thereby permitting the over-pressurized fluid contents of said container to escape through said fracture.

4,513,875

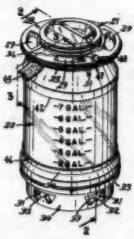
FLOWABLE SUBSTANCE CONTAINER AND DISPENSER

Jack W. Kuehn, Sr., 3500 W. Highway 13, Burnsville, Minn. 55337

Continuation-in-part of Ser. No. 485,661, Apr. 18, 1983, abandoned. This application Jan. 12, 1984, Ser. No. 570,235

Int. Cl.³ B65D *7/02*

U.S. Cl. 220—214 **83 Claims**



1. A device for storing and dispensing a flowable substance comprising:

(a) a container adapted to hold the flowable substance having a top end; a bottom end; a container sidewall having an

inner surface and an outer surface; and said container forming a container aperture proximate to said top end;

(b) a multiply positionable lid, having, with respect to said container aperture, a closed position, an access position and a remove position, said lid adapted to sealably and removably engage said top end of said container and said lid having a lid aperture;

(c) a frangible access seal interposed between said container and said lid; and

(d) a two-state lid removal indicator operably connected to said lid and said container, whereby, assuming that said lid removal indicator is initially in a first state, when said lid is in said closed position, the flowable substance is inaccessible and said indicator is in said first state; when said lid is in said access position, said container aperture is aligned with said lid aperture allowing access to the flowable substance upon altering said frangible access seal and said indicator is in said first state; and when said lid is in said remove position said lid removal indicator is irreversibly in a second state, and said lid can be removed to allow replacement of said frangible access seal.

4,513,876

CONTAINER LID WITH AN OPENER DEVICE

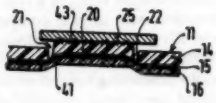
Norbert Buchner, Winnenden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,343

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321572

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **18 Claims**



1. A container lid comprising an outer, relatively thick carrier layer of a thermoplastic material, an inner sealing layer made of a thermoplastic material and adapted to be heat sealed to a container body, a middle barrier layer preferably comprising a thin metal foil, a weakened line stamped into the carrier layer and surrounding a tear-open part, wherein said barrier layer is weakened along a line coinciding in location with said weakened line in the carrier layer, at least in the area in which the tear is iniatially started.

4,513,877

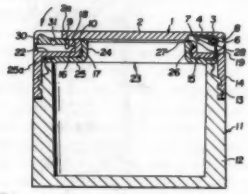
CONTAINER HAVING SPRING BIASED HINGE

Toshio Taguchi; Hisashi Akino, both of Yokohama, and Takamitsu Nozawa, Tokyo, all of Japan, assignors to Shiseido Co., Ltd. and Yoshino Kogyosho Co., Ltd., both of Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,904

Int. Cl.³ B65D *43/24*

U.S. Cl. 220—335 **10 Claims**



1. A container, comprising

a coiled spring, a hinge shaft engaged with the spring, a cover and a container body coupled with the cover through the hinge shaft engaged with the spring,

a recess formed at a shaft hole opening of the cover and the container body for containing the coiled spring with one end of the spring connected thereto,

a connecting portion formed at other end of the cover and the container body for connecting the other end of the coiled spring,

a connecting piece disposed substantially opposite to the connecting portion at the recess opening end for temporarily connecting the other end of the coiled spring, and

a packing of ring-shaped elastic material elastically contacted with lower surface of the cover over entire periphery at upper end thereof within the upper end of the container.

4,513,878

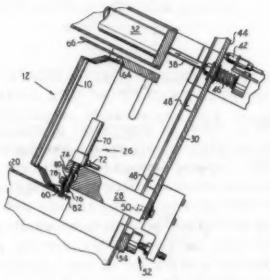
CARTON FEEDING APPARATUS

Thomas S. Hartness, and Thomas P. Hartness, both of Greenville, S.C., assignors to Hartness International, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 205,194, Nov. 10, 1980, Pat. No. 4,392,586. This application Mar. 29, 1983, Ser. No. 480,103

Int. Cl.³ B65H *3/08*

U.S. Cl. 221—40 **8 Claims**



1. An apparatus for feeding cartons in succession from a stack of cartons, said cartons being substantially rectangular in shape with an edge wall extending therearound, said apparatus comprising:

a support plate;

a plurality of picker fingers carried on said support plate;

said picker fingers including,

(i) a power-operated cylinder;

(ii) a gripping head carried on an end of a piston rod extending out of said power-operated cylinder said gripping head including a radially extending flange and an abutment spaced from said flange whereby activation of said cylinder retracts the piston moving the flange towards the abutment for grasping a carton edge therebetween;

means for selectively moving said support plate to and from said stack of cartons for positioning said picker fingers in a picking position adjacent an end carton in said stack;

means for activating said power-operated cylinder causing said gripping head to be retracted to a closed position grasping an edge of said end carton,

said means for moving said support plate and picker fingers away from said stack of cartons to a depositing position; and

means for deactivating said power-operated cylinder releasing said end carton.

4,513,879

HOT/COLD FOOD DISPENSING MACHINE

Linda Reiss, 63 Austin Rd., Sudbury, Mass. 01776

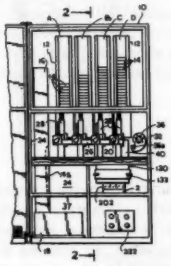
Continuation-in-part of Ser. No. 282,244, Jul. 13, 1981, Pat. No. 4,483,078. This application Dec. 29, 1983, Ser. No. 566,526

Int. Cl.³ G07F *11/72*

U.S. Cl. 221—150 HC **9 Claims**

1. In a food dispensing machine comprising a cabinet, a

refrigeration compartment disposed in an upper portion of said cabinet, including storage means in said refrigeration cabinet compartment storing articles of food, a food guide compartment disposed in a central portion of said cabinet, including selection means for selecting an article of food from said storage means and guide means for guiding such article generally downwards; and a food dispensing compartment disposed in said cabinet below said food guide compartment, including a microwave food heating device for selectively automatically heating articles of food, as desired by a user, means for receiving an article of food from said guide means and depositing the same into a cooking section of said microwave food heating device, means for controlling a heating and cooking cycle of said device in response to said article of food being so deposited into said cooking section, means for automatically ejecting the heated article of food at the end of a heating and cooking cycle, receptacle means for receiving the ejected article and presenting the same to the user, means for permitting evapo-



rated moisture generated during a heating and cooking cycle to escape from said cooking section, and means in said refrigeration compartment preventing condensed moisture forming therein from dripping into said food guide compartment; the improvement wherein said food guide compartment includes a blower disposed above said microwave food heating device for blowing evaporated moisture generated during a heating and cooking cycle from above said microwave food heating device to another section within said food guide compartment where the evaporated moisture can condense, condensing means in said other section for condensing said evaporated moisture, and means conducting the condensed moisture out of said other section of said food guide compartment, the blower and the conducting means thus preventing such moisture from dripping, as condensate, into said microwave food heating device, thereby minimizing the prospect of moisture-caused misoperation during periods of repeated use.

4,513,880
BILL RETENTION DEVICE

Yoshikazu Mori, Moroyama; Susumu Kojima, and Osamu Kobayashi, both of Sakado, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco., Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 409,017
Claims priority, application Japan, Aug. 24, 1981, 56-131462
Int. Cl.³ B65H *5/28*
U.S. Cl. 221—260 **11 Claims**

1. A bill retention device comprising:

a first rotary member including a guide belt and a first winding drum to which one end of said guide belt is secured, said guide belt being unwindably wound on said first winding drum;

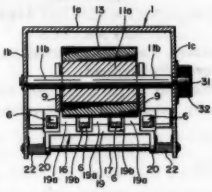
a second rotary member disposed in parallel to said first rotary member and including a second winding drum to which the other end of said guide belt is secured, said guide belt being windable on said second winding drum;

a guide path for introducing bills sent from outside into the interior of said bill retention device; and

guide means for guiding bills introduced through said guide path to a position in which said guide belt is wound on said second rotary member;

wherein the bills guided by said guide means are wound on said second rotary member with said guide belt as said second rotary member is rotated, thereby causing the bills to be retained in a state in which the bills are wound on said second rotary member with said guide belt;

said bill retention device further comprising a motor for rotating said second rotary member, said guide belt being wound on said second rotary member by rotation of said motor in a predetermined direction and said first rotary



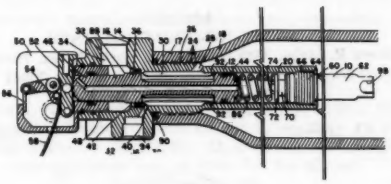
member being thereby driven to unwind said guide belt by a length wound on said second rotary member;

wherein said guide belt comprises a belt-like spring which is processed such that an automatic winding force is produced in a direction in which the guide belt is wound on said first rotary member and no automatic winding force is produced in a direction in which the guide belt is wound on said second rotary member and, when said guide belt is unwound from said second rotary member, said guide belt is automatically wound on said first rotary member by the automatic winding force.

4,513,881
TEMPERATURE COMPENSATOR FOR PRESSURE REGULATOR

John F. Heimovics, Jr., Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 7, 1983, Ser. No. 456,230
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—54 **5 Claims**



1. A temperature compensator for a gas pressure regulator having:

(a) a valve member movable to open a pressurized gas discharge orifice, said valve member having at least a first effective end area exposed to gas under pressure in said regulator and positioned to provide a force for urging said valve member in a direction to close said orifice and a second effective end area exposed to gas under pressure and positioned to provide a force for urging said valve member in a direction to open said orifice; and

(b) a resilient means providing a force for urging said valve member in a direction to open said orifice;

wherein said temperature compensator includes a temperature sensitive adjusting means for adjusting the amount of valve member movement in response to increases in temperature providing smaller orifice openings at lower temperatures and larger orifices at higher temperatures to maintain an optimum flow of gas to an aspirator for filling inflatables with a gas and

air mixture under pressure where the temperature sensitive adjusting means comprises a piston and cylinder assembly mounted on said regulator and connected to said valve member, a fluid in the cylinder of said assembly, said fluid being expandable and contractable in response to an increase or reduction of temperature whereby the piston of said assembly is moved to different temperature compensating positions for adjusting the amount of valve member movement and said piston being engageable with said resilient means to vary the amount of force provided by said resilient means in response to said increases and reductions in temperature.

4,513,882

CONTINUOUS TRANSPORT METHOD AND APPARATUS

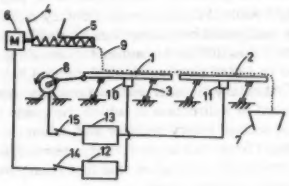
Robert Cabi-Akman, Chavannes, Switzerland, assignor to Nestec, S.A., Vevey, Switzerland

Filed Jul. 9, 1982, Ser. No. 396,760

Claims priority, application Switzerland, Jul. 23, 1981, 4804/81

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—56 **9 Claims**



1. A continuous transport method which detects overloads on a tray, comprising the steps of supplying a particulate product to the tray, transporting a particulate product along the tray by vibrating the tray at a pre-determined basic frequency, and detecting an incipient product overload on the tray by monitoring the vibrations of the tray and comparing with a pre-determined critical threshold the amplitude of at least one harmonic of said basic frequency, which harmonic is sensitive to the load on the tray.

4,513,883

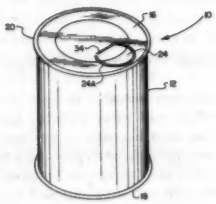
NO-FLIP, NO-DRIP CONTAINER

Edward R. Melzi, 3310 Ivanhoe La., Garland, Tex. 75042, and Arie Sharon, 1014 Wake Dr., Richardson, Tex. 75081

Filed Sep. 6, 1983, Ser. No. 529,509

Int. Cl.³ B67B *7/24*

U.S. Cl. 222—83 **3 Claims**



1. A disposable container assembly comprising a container body formed by a cylindrical sidewall member having opposite ends which are sealed along a rim by first and second lid members, said first and second lid members having first and second tab portions defined by curved score lines, and a rigid connecting rod disposed within the interior of said container and coupled between said first and second tab members whereby an inwardly directed force applied to one of said tab members causes the tab member to separate from said lid and rotate inwardly, and the other tab member to separate away from said lid and rotate outwardly.

4,513,884

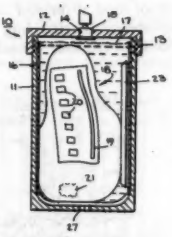
DISPENSING SYSTEM AND A REFILL POUCH

David J. Magid, Doylestown, Pa., assignor to Enviro-Spray Systems, Inc., Montgomeryville, Pa.

Filed Apr. 5, 1982, Ser. No. 365,552

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—94 **11 Claims**



1. A reusable pressurized dispensing system adapted for use in seriatum fashion with a plurality of pouches which contain therein the product to be dispensed and which comprises

container means including an opening therein adapted to house a pouch including therein the product to be dispensed;

removable closure means adapted to cover said container opening;

outlet means disposed in said removable closure means through which the product within the pouch is dispensed;

a sealed inflatable pouch including therein a prepackaged flowable product to be dispensed and which is disposed within said container means, said inflatable pouch being adapted to define a liner within said container upon expansion thereof;

a sealed expandable pressure generating bag disposed within said inflatable pouch for exerting pressure on said flowable product within said pouch;

means within said bag for expanding said bag within said pouch to dispense said prepackaged flowable product from said pouch through said container outlet means;

means for activating said bag expanding means disposed within said pouch;

means for generating additional bag expansion as product is dispensed from said pouch through said container outlet; and

means for opening said pouch to facilitate communication of said flowable product contained therein with said outlet means whereby said flowable product may be dispensed from said container.

4,513,885

DISPENSER HAVING A FLEXIBLE FLUID CONTAINER AND A ROTOR COMPRESSIBLE FLUID DISCHARGE TUBE

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Continuation of Ser. No. 35,817, May 4, 1979, abandoned. This application Sep. 29, 1982, Ser. No. 427,504

Int. Cl.³ F04B *43/12*

U.S. Cl. 222—95 **20 Claims**

1. A dispenser comprising, in combination,

a dispenser housing defining an interior chamber and includ-

ing side walls and a bottom wall having an opening therein, and a front, general vertical wall,

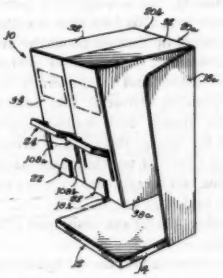
a disposable flexible fluid impervious container adapted to contain flowable product in substantially sealed relation therein, said container having an outlet opening through which said product may be removed from said container,

means cooperable with said container and said housing to releasibly support said container within said chamber so that said product is urged toward said outlet opening under the influence of gravity,

means defining an additional opening in said housing to admit said disposable container for attachment to said means for releasably supporting said container,

a disposable compressible discharge tube affixed to said container adjacent said outlet opening and having flow communication with product within said container,

a disposable discharge fitment mounted on an end of said discharge tube opposite said container and having a discharge orifice in flow communication with said discharge tube, said fitment being adapted for releasable cooperation with said housing so as to maintain said discharge fitment in predetermined relation to said housing,



a rotor rotatably supported within said housing for cooperation with said discharge tube so as to effect flow of product through said discharge tube from said container upon selective rotation of said rotor,

an actuating handle located at said front wall above said discharge fitment and cooperable with said rotor and operable to rotate said rotor with a downward pull on said handle through a predetermined stroke so as to effect a substantially predetermined quantity discharge from said container upon each actuating stroke of said handle, said discharge fitment being located beneath said handle,

a cam plate pivotally mounted on said housing adjacent said opening in the bottom wall and having an arcuate cam surface thereon, said cam plate being pivotally movable independently of said housing between a first position enabling loading of a flexible container and associated discharge tube within said chamber and a second position wherein said cam surface is positioned for cooperation with said discharge tube so as to effect occlusion of said discharge tube during rotation of said motor,

and means selectively cooperable with said housing and said cam plate for releasably retaining said cam plate in its said second position.

4,513,886

APPARATUS FOR FEEDING ADHESIVE IN ROD FORM

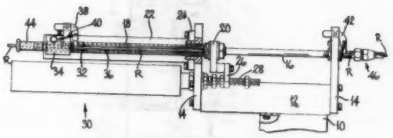
Frank C. Price, Leicester, England, assignor to USM Corporation, Farmington, Conn.

Filed Jan. 20, 1983, Ser. No. 459,385

Claims priority, application United Kingdom, Jan. 21, 1982, 8201704

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146.5 **7 Claims**



1. An apparatus for feeding adhesive in rod form progressively to a melt chamber, comprising:

a first tubular portion through which a rod of adhesive can pass and be guided thereby and which can be connected to a melt chamber, and a device by which the rod of adhesive can be engaged and which is movable, between a retracted and an advanced position, relative to the first tubular portion, whereby to fed the portion of adhesive rod accommodated in the latter to the melt chamber, characterized in that a second tubular portion is mounted for movement with the rod-engaging device relative to the first tubular portion, through which second tubular portion the adhesive rod can pass and which provides a sliding fit with said rod, and in that the external dimensions of the first tubular portion, the arrangement being such that, with the rod-engaging device in its retraced position, the downstream end of the second tubular portion is accommodated with the upstream end of the first tubular portion, and, as the rod-engaging device moves to its advanced position, the second tubular portion slides within the first tubular portion, the second tubular portion being supported at its upstream end by a third tubular portion, which also is movable with the rod-engaging member relative to the first tubular portion, through which also the adhesive rod can pass and the bore of which is alinged with that of the second tubular portion to minimize obstruction of the adhesive rod therewithin.

4,513,887

INSTANT HOT WATER DISPENSER

Charles A. Wicke, and Wayne C. Riley, both of Racine, Wis., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 421,633, Sep. 22, 1982, Pat. No. 4,424,767. This application Nov. 16, 1983, Ser. No. 552,465

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146.5 **1 Claim**

1. An instant hot water heater dispenser comprising:

a. tank means for storing and heating water prior to dispensing thereof, the tank means having an upper tank wall portion;

b. wall means formed integrally with the upper tank wall portion for defining an open top water expansion chamber;

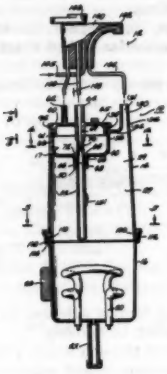
c. a valve chamber wall formed integrally with the wall means;

d. a cover for sealingly closing the expansion chamber, the cover including:

i. a vent and a cold water inlet stem formed integrally with the cover, the inlet stem extending downwardly from the cover and having an aspirator opening to provide communication between the inlet water and the expansion chamber; and

ii. a valve chamber wall formed integrally with the cover for cooperating with the wall means valve chamber

wall to define a valve chamber for confining an aspirating valve member therein; and



e. retainer means for locking the cover in place to the expansion chamber wall means.

4,513,888

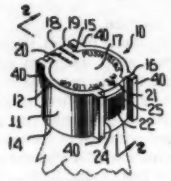
DISPENSING CAP

John J. Curry, 2 S. 752 Theresa Ct., Oak Brook, Ill. 60521

Filed Sep. 30, 1982, Ser. No. 428,742

Int. Cl.³ B65D *55/02*

U.S. Cl. 222—153 **5 Claims**



1. A dispensing cap comprising an annular ring having upper and lower terminal ends, an intermediate panel being positioned between said upper and lower terminal ends in a generally normal position to said terminal ends, said intermediate panel having a dispensing opening located therein, annular sealing means fixed to said intermediate panel and projecting generally parallel to said lower terminal end, retaining means projecting generally normal from said lower terminal end, said sealing means and said retaining means facilitating said cap to be attached to a container, said upper terminal end having two opposed recesses formed therein, a cover, a first of said recesses having hinge means for hingeably securing said cover to said annular ring, said hinge means including biasing means for maintaining said cover in an open position, said cover having a tab, a second of said recesses defining an opening to receive said tab when said cover is in a closed position, a portion of said annular ring having a flexible panel beneath said second recess, said flexible panel being capable of movement inwardly of said annular ring when radially inward pressure of sufficient force is exerted by a user to expose a portion of said cover tab thereby facilitating movement of said cover from the closed position upwardly to the open position, and said flexible panel being defined by two transverse substantially parallel slots extending from said second recess.

4,513,889

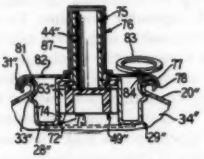
RECLOSABLE VALVE WITH REMOVABLE HERMETIC EXTERNAL SEAL MEANS

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Dec. 27, 1982, Ser. No. 452,953

Int. Cl.³ B65D *55/08*

U.S. Cl. 222—153 **10 Claims**



1. An aerosol-type dispensing device comprising a fluid dispensing valve structure in combination with a pressurizable container, said valve structure being adapted to dispense the fill contents of said container, said valve structure comprising:

valve mounting cap having (a) a perimeter region which terminates in a rolled lip that is sealingly secured over a mating rolled lip formed about the mouth of said pressurizable container, (b) a central portion with an aperture defined therein, and (c) generally continuous wall portions extending between said central portion and said perimeter region and defining therebetween a cavity adapted for receipt thereinto of crimp forming means;

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second end extending through said aperture;

resilient valve seat means positioned in said valve mounting cup body;

a movable valve means biasable against said valve seat means to close said valve structure, said movable valve means comprising a moveable cup that is slidably longitudinally reciprocal within portions of said valve body responsively to tilting movement of said one end of tubular nozzle means;

said tubular nozzle means being moveable and having said second end thereof adapted for moving said moveable valve means to open said valve structure;

said resilient valve seat means comprising a gasket circumferentially disposed about said second end of said tubular nozzle means whereby when said one end is tilted relative to said valve mounting cup body, said moveable cup is moved from said gasket, thereby to permit flow of said fill contents through said tubular nozzle means;

a gas-tight sealing member comprised of sheet metal and having a central region which is positioned over said tubular nozzle means and having peripheral portions positioned in spaced adjacent relationship to said central portion, and in contacting adjacent relationship to said perimeter region;

a gas-tight sealing means securing said peripheral portions to portions of said perimeter region;

a frangible zone extending in a closed pathway generally adjacent said central portion and defined in at least one of said sealing member and said sealing means, said frangible zone being rupturable in response to applied localized external force, whereby at least said central region is removable from said central portion and said nozzle means.

4,513,890
CAP FOR A PRESSURIZED CONTAINER AND THE CORRESPONDING UNIT

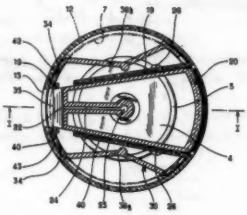
Antonin L. Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 258,291, Apr. 28, 1981, abandoned. This application Aug. 26, 1983, Ser. No. 526,514

Claims priority, application France, May 30, 1980, 80 12112; Jan. 23, 1981, 81 01221; Feb. 10, 1981, 81 02605

Int. Cl.[3] B65D *83/14*

U.S. Cl. 222—153 **29 Claims**



1. A presentation cap for a pressurised "aerosol spray" container, such cap comprising: fixed cap means including a cylindrical cap body having a side wall and a top wall provided with an opening, means effective to attach the cap body to a pressurised container, a sleeve within the cap body, said sleeve having mutually opposite concave wall portions curved with respect to the axis of said cylindrical cap body and facing radially outwardly, said concave wall portions having lower edges adapted to bear on top of a crimped rim of a valve mounting cup of a spray container, and said sleeve having at least two opposite arcuate convex wall portions in engagement with the cap body, means defining a window in said cap body side wall, and means for ensuring angular positioning of the cap body on said sleeve; movable cap means comprising a push button disposed in said opening in said cap body top wall so as to be maneuverable by a user's finger, said push button having first and second ends, means on said push button for receiving the outlet of a discharge valve of a said pressurised container, means at the first end of said push button defining a dispensing nozzle of said push button, said dispensing nozzle being located at one of said opposite wall portions of said sleeve, and means defining a duct communicating said valve outlet receiving means with said dispensing nozzle; and hinge means pivotally attaching said push button to said sleeve, said hinge means being located at said one opposite wall portion of said sleeve whereby said hinge means is located immediately adjacent said cap body side wall, with said dispensing nozzle in register with said window of the cap body.

4,513,891
SPRAY DISPENSING CONTAINER AND VALVE THEREFOR

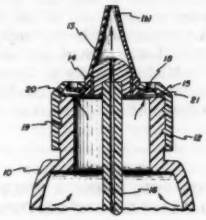
Robert W. Hain, Scotch Plains; Frederick B. Hadtke, New Providence, both of N.J., and Myron Paikoff, Colonie, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,722

Int. Cl.[3] B05B *11/04*

U.S. Cl. 222—213 **21 Claims**

1. In a squeeze bottle dispenser for use in the administration of nasal sprays having means for preventing inspiration of air through the exit opening of said dispenser during the recovery portion of a use cycle in order to thereby prevent contamination of the dispenser contents, the improvement for attachment to, and use with, a said squeeze bottle which comprises in combination: a closure cap defined generally by a top wall and a side skirt for removable attachment to the neck of said squeeze bottle, said cap having (1) one or more air inlet holes and a central hole in said top wall and (2) means for retaining within said central hole; a one piece, resilient spray nozzle unit comprising an exit nozzle portion and a flexible flanged portion and a flexible flanged portion; and a dip tube for conveying the contents of said bottle to said spray nozzle unit, said retaining means comprising an annular rim around the inside of said side skirt of said closure cap and spaced from said top wall thereof,



said spray nozzle unit being adapted to function as a two-way valve whereby, during the dispensing portion of a use cycle, said air inlet hole or holes are sealed by said flexible flange while said nozzle is open, and whereby, during the recovery portion of a use cycle, said air inlet hole or holes are opened and said nozzle is closed.

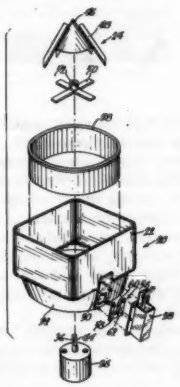
4,513,892
FLAKED ICE DISPENSER

Robert M. Koeneman; Benjamin D. Miller, both of Elmwood Park; Thaddeus M. Jablonski, Palatine, and Albert L. Schafer, Chicago, all of Ill., assignors to Remcor Products Company, Franklin Park, Ill.

Filed Apr. 15, 1983, Ser. No. 485,394

Int. Cl.[3] B65D *23/00*

U.S. Cl. 222—235 **17 Claims**



1. An ice dispenser for small particles of ice, such as flaked ice, comprising a hopper for storage of a mass of small particles of ice, said hopper having a bottom wall, a trough around the outer periphery of said bottom wall and an opening therethrough in communication with said trough; an impeller rotatable in said hopper for rotating and agitating ice therein, said impeller including a generally cone shaped body mounted for rotation in said hopper about an axis coextensive with its altitude with its vertex above said bottom wall and its surface extending outwardly and downwrdly from said vertex, and a plurality of arms mounted in angularly spaced relationship on said body surface, said arms extending outwardly of said surface and along paths extending generally between said vertex and the base of said body; and means for rotating said impeller

in said hopper to rotate and agitate ice therein to prevent the small particles of ice from agglomerating and congealing, to move ice in said trough to and through said hopper opening for being discharged from said hopper, and to cause ice in said hopper overlying said trough to enter said trough to replace ice discharged through said opening, wherein said hopper, in cross section perpendicular to said axis of rotation of said impeller and between an upper end of said hopper and said bottom wall, has a substantially circular upper portion and a substantially polygonal lower portion, and said lower portion has corners which extend outwardly of the circumference of said upper portion, whereby as ice is discharged from said hopper ice in said upper portion falls into said corners and then into said trough.

4,513,893

APPARATUS FOR SPREADING A POLYURETHANE FOAMABLE COMPOSITON

Morimitsu Baba, Fukuoka, Japan, assignor to Asahi Glass Company Ltd., Tokyo and Baba Seisakusho Co., Ltd., Yame, both of, Japan

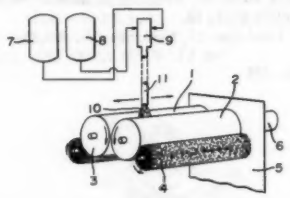
Continuation of Ser. No. 185,911, filed as PCT JP 79/00054, Mar. 7, 1979 published as WO 79/00734 Oct. 4, 1979 § 102(e) date Sep. 26, 1979, Pat. No. 4,332,281. This application Mar. 10, 1982, Ser. No. 358,852

Claims priority, application Japan, Mar. 10, 1978, 53-26633; Sep. 9, 1978, 53-110223

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ B05B *3/02*

U.S. Cl. 222—281 **3 Claims**



1. An apparatus for spreading a foamable composition for a polyurethane foam which comprises:

a pair of spreading rolls which are arranged in parallel with a gap having faced surfaces rotated downwardly;

a feed outlet for feeding said foamable composition for a polyurethane foam on the surfaces of said spreading rolls, at an upper position above said spreading rolls;

a pair of rotated scattering rolls having fibrous surface layers which are located below said spreading rolls with said fibrous layers being in contact respectively with said surfaces of said spreading rolls;

and said feed outlet for feeding said foamable composition being reciprocally movable in the longitudinal direction of said spreading rolls above said spreading rolls.

4,513,894

ABRASIVE SLURRY SUPPLY SYSTEM FOR USE IN METALLOGRAPHIC SAMPLE PREPARATION

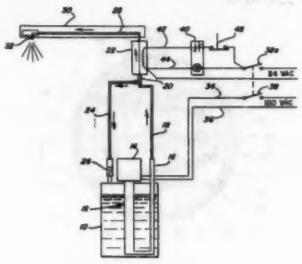
Ralph R. Doyle, Des Plaines, and Robert E. Zimmer, Niles, both of Ill., assignors to Buehler Ltd., Lake Bluff, Ill.

Filed Oct. 12, 1982, Ser. No. 433,633

Int. Cl.³ B24B *57/00*

U.S. Cl. 222—644 **7 Claims**

1. A slurry dispensing system for supplying a portion of abrasive slurry to apparatus for preparing the surface of metallurgical specimens, said system comprising, in combination, reservoir means for containing a supply of abrasive slurry, first conduit means leading from said reservoir means, pump means for pumping abrasive slurry from said reservoir means through said first conduit means, second conduit means leading from said first conduit means back to said reservoir means for recirculating abrasive slurry pumped by said pump means, third conduit means communicating with said first and second conduit means and including normally-open valve means leading to nozzle means for supplying a portion of abrasive slurry to said apparatus, said nozzle means being disposed at a higher level than said first and second conduit means, and said reservoir means being located at a lower level than said first and second conduit means, timer control means for closing said normally-open valve means at timed intervals, and means for



operating said pump continuously whereby when said valve means is open at least a portion of the abrasive slurry pumped from said reservoir means will be dispensed for use with said apparatus, when said timer control means closes said valve means, all of the slurry pumped by said pump means will be recirculated to said reservoir means, and when said pump means is inoperative the abrasive slurry in said first, second and third conduit means will automatically drain back to said reservoir means.

4,513,895

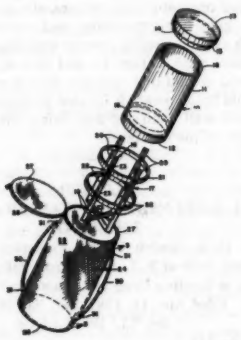
FLEXIBLE INSULATIVE CARRIER

Peter C. Leslie, 123 S. Justison St., Wilmington, Del. 19801

Continuation-in-part of Ser. No. 404,220, Aug. 2, 1982, abandoned. This application Mar. 12, 1984, Ser. No. 588,212

Int. Cl.³ A45C *9/00*

U.S. Cl. 224—151 **12 Claims**



1. An improved thermally insulated carrier comprising:

(a) a container having a circular cylindrical wall, a fixed bottom closure and a removable, tight-fitting lid, fabricated entirely of a closed cell foam of a resilient polymer,

(b) a harness comprised of strong, wide webbing adapted to lie in close-fitting contact with the exterior of said cylindrical wall and bottom closure, said webbing crossing at several sites, and interengaged at said sites of crossing,

(c) a cloth jacket adapted to encompass said container and harness in close-fitting engagement therewith, said jacket comprising a sidewall portion made from flat fabric by

forming a straight seam, and a flat bottom portion joined to the sidewall portion by a circular seam,

(d) anchor means disposed upon the exterior of the sidewall portion of said jacket in sewn engagement with said jacket and said harness, and

(e) a pair of carrying straps adapted to engage said anchor means,

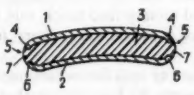
(f) whereby said carrier is adapted to be carried in the manner of a backpack, and the subcombination comprising the harness, jacket and carrying straps finds separate utility as a duffle bag.

4,513,896

BELT OR STRAP

Hermann Hirsch, Klagenfurt, Austria, assignor to Hermann Hirsch Leder- und Kunststoffwarenfabrik, Klagenfurt, Austria

Filed May 31, 1983, Ser. No. 499,514
Claims priority, application Austria, Jun. 17, 1982, 2346/82
Int. Cl.³ A44C *5/00*
U.S. Cl. 224—178 **5 Claims**



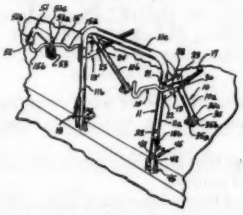
1. A flexible strap that simulates an all-leather strap, comprising a face material of leather and a lining of leather interconnected by an elastic layer whose thickness is substantially greater than that of the face material or the lining, at least one of said face material and lining being bent partway about said elastic layer at the longitudinal edges of the strap, the elastic layer extending adjacent to the longitudinal edges of the face material and lining as far as to the outside surface of the face material and the lining, the leather of said face material and lining having the flesh side adjacent and impregnated by said elastic layer.

4,513,897

VEHICLE ATTACHED CARRIER

John W. Graber, Stoughton, Wis., assignor to Graber Products, Inc., Madison, Wis.

Filed Jan. 27, 1984, Ser. No. 574,337
Int. Cl.³ B60R *9/10*
U.S. Cl. 224—314 **6 Claims**



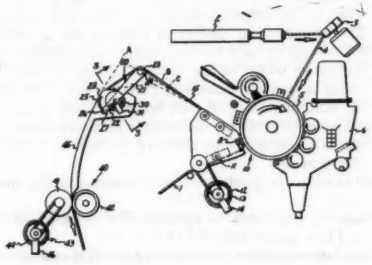
1. A carrier for mounting on the rear body portion of a vehicle, the carrier including carrier frame means having front and rear pairs of elongated legs interconnected at their upper ends and with their distal ends spaced apart to engage a rear body portion of a vehicle at spaced locations, a front vehicle engaging foot for the distal end of each of the front pair of legs, a rear vehicle engaging foot assembly on the distal end of each leg of the rear pair of legs, each rear vehicle engaging foot assembly including a pair of generally U-shaped bracket members disposed in generally parallel relation at opposite sides of the distal end of a respective one of the legs of the rear pair, each pair of bracket members having an intermediate web portion and first and second leg portions, first and second parallel pivot pins respectively extending between the first and second leg portions of each pair of bracket members adjacent the distal ends thereof, each vehicle engaging foot assembly including first and second vehicle engaging foot members each having a generally flat vehicle engaging face and a mounting portion extending above the vehicle engaging face, the mounting portions of the vehicle engaging foot members having openings therethrough generally paralleling the associated vehicle engaging face for receiving the respective first and second pivot pins to support the foot members for pivotal movement relative to the bracket members about the axis of the respective pivot pin, each rear vehicle engaging foot assembly including a bracket pivot pin extending through the web portions of the pair of bracket members and through the associated rear leg adjacent its distal end for pivotally mounting the pair of bracket members for movement about a bracket pivot axis transverse to the associated rear leg and parallel to and medially between the associated first and second pivot pins, the bracket pivot axes on the rear pair of legs being disposed in substantial axial alignment, the bracket pivot axis of each rear vehicle engaging foot assembly being offset from a plane through the associated first and second pivot pins a distance sufficient to allow the bracket members to pivot relative to the associated rear leg into positions in which the first and second rear vehicle engaging foot members are disposed at relatively opposite sides of the associated rear leg outwardly of the distal end thereof and into positions in which both the first and second rear vehicle engaging foot members are disposed at one side of the associated rear leg adjacent the distal end thereof, the first and second vehicle engaging foot members being movable about the first and second pivot axes relative to the associated pair of bracket members into positions in which the vehicle engaging faces on the first and second foot members converge to conform to convex exterior surfaces gn a vehicle and positions in which the vehicle engaging faces diverge to conform to concave exterior surfces on the vehicle, and strap means for holding the carrier on a vehicle.

4,513,898

WEB LOOP CONTROL APPARATUS AND METHOD

Merlin D. Spitsbergen, Rochester, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Mar. 22, 1982, Ser. No. 360,945
Int. Cl.³ B65H *25/04*
U.S. Cl. 226—44 **17 Claims**



1. A web loop control system for a web feeding apparatus, having a first roller means engaged with said web; a second roller means engaged with said web having a drive means and a drive means control; and a dancer member pivotally supported on said apparatus operationally intermediate said first roller means and said second roller means, said dancer member rotatably supporting a dancer roller, said dancer roller being biased into engagement with said web, said web sequentially

passing from said first roller means to said dancer roller to said second roller means and being disposed in a web loop between said first roller means and said second roller means, said dancer member pivoting to follow said web loop as the length of said web loop varies, the improvement comprising:

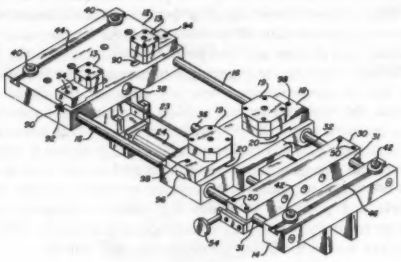
a code disk secured for rotation with said dancer arm, and an optical transmitting means and an optical receiving means, said optical transmitting means transmitting light towards said code disk, the rotational position of said code disk determining the light received by said optical receiver from said optical transmitter, said optical receiver generating said dancer arm position information in response to the light received, said dancer arm position information being transmitted to said second roller means motor control means to adjust said drive means for said second roller means as necessary to achieve a desired length for said web loop.

4,513,899

STOCK FEEDER WITH ADJUSTABLE WIDTH FEED PATH

Harry J. Ledgerwood, Conway, Mo., assignor to Plessey Incorporated, Melville, N.Y.

Filed Aug. 10, 1982, Ser. No. 406,766
Int. Cl.³ B65H *17/36, 23/02*
U.S. Cl. 226—141 **5 Claims**



1. A stock feeder for repetitively feeding or advancing stock material, said stock feeder comprising:

a front block including two side edges, said feed block defining opposed first keyways extending from each side edge thereof, a first guide track extending between the side edges,

a pair of holding clamps means, each holding clamp means defining a projection slidably mounted in a different one of said first keyways, said pair of holding clamp means being independently slidable and releasably fixable in said first keyways and capable of abutting one another,

a slot defined by each holding clamp means extending across the entire width of the bottom surface of each holding clamp means and extending partially across the length of the bottom surface of each holding clamp means,

a piston reciprocatively mounted in each said holding clamp means to project into said slot defined by each holding clamp means,

first stock roller guides slidingly mounted in said first guide track,

means for releasably fixing each first stock roller guide in said first guide track,

a rear block including two side edges, said rear block defining a second guide track extending between the side edges thereof,

second stock roller guides mounted in said second guide track,

means for releasably fixing said second stock roller guide in said second guide track,

guide rods interconnecting said front block and said rear block, said guide rods being aligned parallel to each other,

a unitary feed block including two side edges, said unitary feed block slidably mounted on said guide rods, said unitary feed block located between said front block and said rear block, said unitary feed block defining opposed second keyways extending from each side edge thereof,

a pair of gripping clamps means, each gripping clamp means slidably mounted in a different one of said second keyways, said pair or gripping clamp means being independently slidable and releasably fixable in said second keyways and capable of abutting one another,

a slot defined by each gripping clamp means extending across the entire width of the bottom surface of each gripping clamp means and extending partially across the length of the bottom surface of each gripping clamp means,

a piston reciprocatively mounted in each said gripping clamp means to project into said slot defined by each gripping clamp,

a stop block slidingly mounted on said guide rods for adjusting the distance of travel of said unitary feed block, said stop block being located between said unitary feed block and said rear block,

means for releasably fixing said stop block to said guide rods,

a fine adjustment bar for further adjusting the distance of travel of said unitary feed block, said fine adjustment bar being located between said unitary feed block and said stop block,

means for adjusting said fine adjustment bar to change the distance between the fine adjusting bar and the stop block,

means for reciprocatively moving said unitary feed block along said guide rods, and

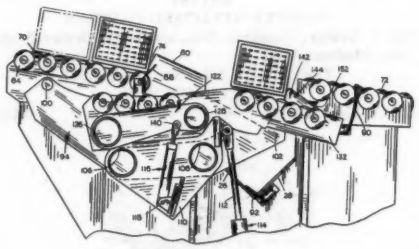
control means for controlling the advancement of successive segments of stock material by said unitary feed block.

4,513,900

WOOD CROSS-TIE END PLATING MACHINE

Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Filed Nov. 21, 1983, Ser. No. 553,779
Int. Cl.³ A43D *71/00;* **B25C** *7/00*
U.S. Cl. 227—42 **6 Claims**



1. An end plating machine for wood cross ties, comprising,

a frame means including horizontally spaced-apart end frames,

each of said end frames having spaced-apart cross tie in-feed and out-feed portions,

each of said end frames having stop means thereon adjacent the inner ends of said in-feed portions for limiting the inward movement of said ties on said in-feed portions,

said in-feed portions adapted to receive the ends of at least one cross tie,

a first stationary platen means on one of said end frames,

a second stationary platen means on the other of said end frames,

said stationary platens adapted to support the ends of a cross tie thereon,

a first pair of movable platens on said one end frame,

a second pair of movable platens on the other of said end frames,

hydraulic cylinder means connected to each of said first and second pairs of movable platens for moving said movable platens toward said stationary platens for squeezing the ends of the cross tie positioned on said stationary platens,

a power ram means on each of said end frames for driving end plates into the ends of the cross tie,

a tie elevator assembly positioned between said end frames and having inner and outer ends, the outer end of said tie elevator assembly being pivotally connected, about a horizontal axis, to said end frames,

a first power cylinder connected to said tie elevator assembly for raising and lowering the inner end of said tie elevator assembly relative to said end frames,

a tie transporter assembly having inner and outer ends, said tie transporter assembly being pivotally connected, about a horizontal axis, intermediate the inner and outer ends thereof, to said tie elevator assembly, intermediate the inner and outer ends thereof,

a second power cylinder connected to said tie transporter assembly for pivotally raising and lowering the inner and outer ends of said tie transporter assembly relative to said tie elevator assembly,

control means for:

(a) extending said second power cylinder thereby causing the outer end of said tie transporter assembly to pivotally move upwardly to engage the innermost cross tie on said in-feed portion and to raise said innermost tie above said stop means so that said cross tie can move inwardly onto said tie elevator assembly;

(b) retracting said first power cylinder thereby causing said tie elevator assembly to pivotally move downwardly so that the tie is lowered onto the stationary platens;

(c) operating said hydraulic cylinder means to cause said movable platens to compress the ends of the cross tie;

(d) activating said power ram means to force the end plates into the ends of the cross tie;

(e) retracting said power ram means;

(f) operating said hydraulic cylinder means thereby moving the movable platens out of engagement with the cross tie;

(g) extending said first cylinder and retracting said second cylinder thereby causing the cross tie to be lifted upwardly out of the stationary platens and be delivered to the out-feed portions.

4,513,901

MACHINE FOR MANUFACTURING TACKLESS STRIPS

Clifford H. Gage, Fort Edward, N.Y., assignor to Annette Kowalczyk, Staten Island, N.Y.

Continuation of Ser. No. 317,239, Nov. 2, 1981, Pat. No. 4,447,000. This application Apr. 27, 1984, Ser. No. 604,599

The portion of the term of this patent subsequent to May 8, 2011, has been disclaimed.

Int. Cl.³ B42F *7/02*

U.S. Cl. 227—49 **10 Claims**

1. A machine for automatically applying a plurality of nails into discrete strips of wood, comprising

a conveyor to transport strips of wood through the machine at spaced intervals;

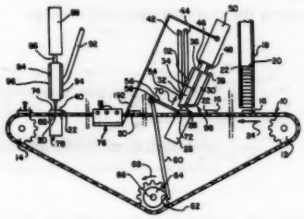
a first nailing station including a first reciprocating ram, the first ram being adapted to drive a plurality of first nails into one surface of each wood strip as the strip is carried to the first nailing station by the conveyor;

a turnover station downstream of the first nailing station;

the turnover station comprising a wood strip turner and means to rotate the turner, the turner being adapted to engage the first end portion of each nailed strip as it is carried from the first nailing station by the conveyor,

the means to rotate the turner comprising an arm connected to the first ram, the arm providing a linear reciprocating power input to the turner upon each reciprocation of the first ram;

the turner being adapted to engage an end portion of each strip and to turn over each strip at the turnover station through one hundred and eighty degrees,



whereby the nails applied at the first nailing station will be rotated through one hundred and eighty degrees at the turnover station.

4,513,902

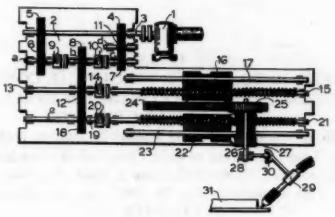
APPARATUS FOR THE AUTOMATIC WELDING OF COMPLEX SHAPES

Plamen V. Tzvetanov; Dyanko V. Chankov; Orlin A. Nikolov, and Alexander L. Ivanov, all of Sofia, Bulgaria, assignors to N P K "Zavarachna Technika", Sofia, Bulgaria

Filed Jul. 12, 1983, Ser. No. 512,932

Int. Cl.³ B23K *1/00*

U.S. Cl. 228—25 **3 Claims**



1. An apparatus for the automatic welding of complex contours made up of rectalinear and curvilinear sectors, said apparatus including first and second carriages reciprocating parallel to each other, one of said carriages having a rack gear fixedly connected thereto and the other of said carriages having a shaft journalled thereon and carrying a gear in mesh with said rack gear, a welding torch mounted upon said shaft journalled on the second carriage, and means for selectively reciprocating the first and second carriages together in synchronism whereby to move the welding torch rectalinearly and for reciprocating only the first carriage while holding the second carriage in a fixed position whereby to move the welding torch in an arch.

4,513,903

METHOD OF REPAIRING LEAKS IN STEAM GENERATOR TUBES

Joel G. Feldstein, North Canton, Ohio, and James E. Gutzwiller, Jr., Forest Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 18, 1982, Ser. No. 444,402

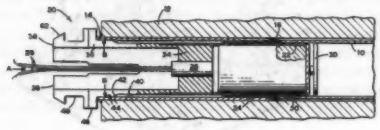
Claims priority, application United States, PCT/US82/01312

Int. Cl.³ B23K *20/08*

U.S. Cl. 228—107 **2 Claims**

1. A method of rapidly repairing a steam generator tube having a defect in the tube in a location encompassed by a tube sheet, comprising the steps of:

cleaning the inside surface of the defective tube;
positioning an explosive welding device on remotely operated tooling;
mounting a thin metallic cylindrical sleeve on the explosive device;
inserting the explosive device with the thin sleeve within the tube using the remotely operated tooling;



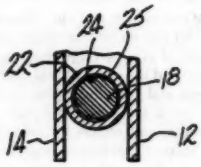
positioning the explosive device with the thin sleeve over the area containing the defect using the remotely operated tooling;
releasing the explosive device with the thin sleeve from the remotely operated tooling and removing the tooling; and
detonating the device to explosively weld the entire surface area of the sleeve to said tube.

4,513,904

METHOD TO REDUCE ELECTRICAL CONTACT RESISTANCE BETWEEN CONTACT SURFACES IN AN ELECTRODE

Kenneth E. Woodard, Jr., and Ronald L. Dotson, both of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 490,612, May 2, 1983, Pat. No. 4,452,685. This application Jul. 29, 1983, Ser. No. 518,595
Int. Cl.³ H01R *11/02*
U.S. Cl. 228—116 **8 Claims**



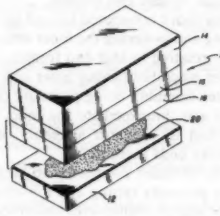
1. A method for reducing the electrical contact resistance between a first contact surface of copper and a second contact surface of a metal selected from the group consisting of titanium and nickel in an electrode of an electrolytic cell comprising:
(a) cleaning the first and second contact surfaces of said copper and said metal;
(b) coating the cleaned first and second contact surfaces with a conductive compound comprised of between about 20 and about 30 percent by weight of indium and about 80 and about 70 percent by weight of gallium;
(c) pressing said coated first and second contact surfaces together, whereby the contact resistance between the coated first and second contact surfaces is reduced.

4,513,905

INTEGRATED CIRCUIT METALLIZATION TECHNIQUE

Ronald S. Nowicki, Sunnyvale, Calif., and John F. Moulder, Sun Fish Lake, Minn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 518,728, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 244,568, Mar. 17, 1981, abandoned. This application May 9, 1984, Ser. No. 586,906
Int. Cl.³ B23K *1/20*; H01L *21/285*
U.S. Cl. 228—123 **12 Claims**



1. In the process of fabricating integrated circuits and other items where a wettable or bondable conductive material is required for reliable contact with other bondable or conductive material, the steps of forming a conductive or bondable layer comprising:
depositing a metal barrier layer on a prepared Si surface, said barrier layer being formed in the presence of N_2 so that N_2 is incorporated into the barrier layer;
depositing a layer of conductive or bondable material on said barrier layer and
subjecting said surface and layers to high temperature,
said barrier layer thus formed reduces migration of the Si through the conductive or bondable material to provide said wettable bonding material after the subjection of said layers to high temperature.

12. A method of fabricating integrated circuits and the like, in part performed in a sputtering apparatus, comprising:
providing a Si surface,
sputtering a barrier layer of a metal selected from the group consisting of chromium, titanium, titanium alloy or titanium plus refractory metals in the low atmospheric chamber of said sputtering apparatus which atmosphere includes N_2 thereby incorporating N_2 in said barrier layer,
sputtering a layer of conductive material on said barrier layer,
placing a bonding pad with a solder on one surface in contact with said conductive material, and
heating said layered material and pad to bond the layered material and pad together,
the barrier layer reducing the migration of Si through the conductive material during the heating step so that the conductive material adheres to the pad.

4,513,906

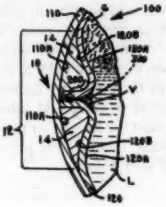
LIQUID TANK WELD CAVITATION PROTECTION

Yi M. Chang, 23146 Califa St., Woodland Hills, Calif. 91367, and James R. Fenwick, 10553 Limerick, Chatsworth, Calif. 91311

Filed Oct. 19, 1983, Ser. No. 543,592
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—184 **12 Claims**

1. A method of protecting an edge weld of a thin metal bladder against a cavitation-induced collapse, wherein said bladder is to be partially filled with a pressurized liquid in motion, and wherein said bladder is disposed within a rigid walled tank, and also wherein the configuration of the interior surface of said bladder at said edge weld is in the structural form of a cavity which is horn-like in shape, said method

comprising the step of interposing a backing made of hard and ductile material between and in contact with the exterior surface of said bladder and the interior surface of said tank at a location adjacent to said edge weld of said bladder.

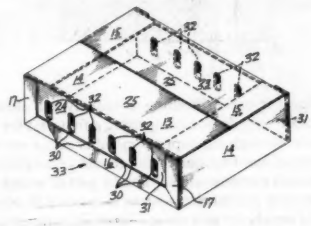


4,513,907

VENTILATED FRUIT FLY PROOF PRODUCE SHIPPER

Lee V. Grosshuesch, Kaneohe, Hi., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jul. 26, 1983, Ser. No. 517,488
Int. Cl.³ B65D *13/04*
U.S. Cl. 229—23 R **24 Claims**



1. A container for preventing insects from depositing eggs in produce contained therein comprising

two pair of opposed side panels,

a bottom panel,

a cover,

one of said panels being formed of two layers of corrugated board,

a plurality of vent holes in said one panel,

a screen between said panel layers and covering said vent holes, to prevent access to the interior of said container

said inner panel layer being of a thickness, each of said vent holes having a width and the mesh of said screen being of a size whereby said produce will be a distance from said screen which prevents an insect from depositing eggs in said produce within said container.

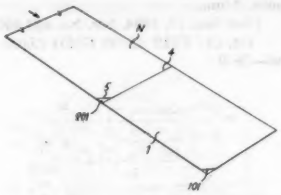
4,513,908

WRAPPER SHEET FOR CIGARETTE PACKS, AND METHOD FOR OBTAINING SAME

Renato Manservisi, Bologna, and Mario Fossi, Funo di Argelato, both of Italy, assignors to Sasib S.p.A., Bologna, Italy

Filed Jul. 7, 1981, Ser. No. 281,191
Claims priority, application Italy, Jul. 15, 1980, 15213/80[U]
Int. Cl.³ B65D *65/00, 75/00*
U.S. Cl. 229—87 C **2 Claims**

1. A wrapper sheet for forming the outer wrapping of a soft cigarette package, comprising a blank including a first portion and a second portion, said first and second portion having a common edge, said first portion having the shape of a rectangle and said second portion having the shape of a non-rectangular parallelogram joined to said first portion along the common edge.

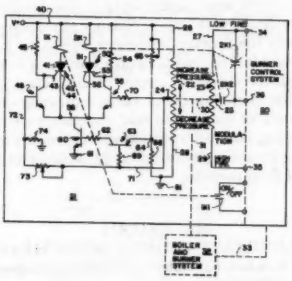


4,513,909

FUEL BURNER CONTROL SYSTEM WITH LOW FIRE HOLE

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 17, 1984, Ser. No. 651,489
Int. Cl.³ F22B *35/00;* **G05D** *15/00*
U.S. Cl. 236—26 R **8 Claims**



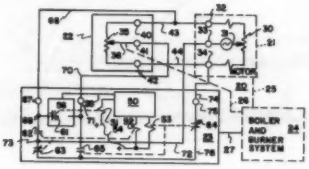
1. A control system adapted to control a fuel burner having a low fire mode, and a modulating mode including a high fire limit of operation for a boiler to provide a fluid pressure, including: pressure responsive means responsive to said fluid pressure in said boiler; said pressure responsive means having two variable impedance means with said two variable impedance means being operated together in response to changes in said pressure; switching circuit means connected to a source of potential and including two switching means with said switching means capable of being energized from said source of potential; a first of said switching means being energized upon said fluid pressure causing a first of said variable impedance means to approach a minimum desirable fluid pressure for said boiler; said first switching means having at least one switchable circuit to control said fuel burner in said low fire mode of operation; a second of said switching means being energized upon said first of said variable impedance means reaching said minimum desirable pressure for said boiler; said second of said switching means having a normally open switchable circuit and a normally closed switchable circuit; and a second of said variable impedance means adapted to be connected through said second switching means switchable circuits to control said fuel burner in said modulating mode when said second switching means is energized.

4,513,910

ADAPTIVE LOW FIRE HOLD CONTROL SYSTEM

James I. Bartels, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 17, 1984, Ser. No. 651,490
Int. Cl.³ F22B *35/00*; G05D *15/00*
U.S. Cl. 236—26 R **9 Claims**



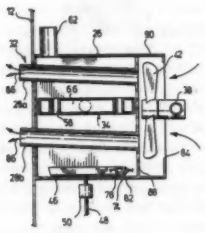
1. A control system adapted to control modulating motor means and a fuel burner with said burner having a low fire mode, and a modulating mode including a high fire limit of operation to heat a boiler to provide a fluid pressure, including: pressure responsive means responsive to said fluid pressure in said boiler; said pressure responsive means having variable impedance means being varied in response to said pressure; fuel burner sequencer means including program means to implement a control sequence for said modulating motor and said fuel burner in response to said variable impedance means; said program means having output means to control said modulating motor means and said fuel burner; impedance detection circuit means having input means and having an output connected to said fuel burner sequencer means; said impedance detection circuit input means being responsive to said variable impedance means with said impedance detection circuit means causing said fuel burner sequencer means to hold said fuel burner in said low fire mode upon a startup of said burner with said impedance detection circuit means detecting said impedance means in an impedance range indicating said fluid pressure is steady or rising; and said impedance detection circuit means causing said fuel burner sequencer means to release said fuel burner to said high fire limit and modulating mode upon a fall in said fluid pressure.

4,513,911

AUXILIARY VEHICLE SPACE HEATER

Francis F. Sanchez, 62 Gibbard Crescent, Collingwood, Ontario, Canada (L9Y 2C2)

Filed Jul. 5, 1983, Ser. No. 510,684
Int. Cl.³ B60H *1/02*
U.S. Cl. 237—12.3 C **9 Claims**



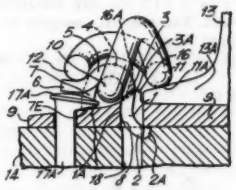
1. An auxiliary vehicle interior space heater comprising a hollow metal housing with a plurality of metal tubes extending generally parallel to each other and through the housing, said tubes having a first set of tube ends and a second set of tube ends in communication with the space exterior of said housing, a gas burner which uses a portable form of fuel located in said housing for heating said tubes, means for mounting said housing on an exterior vehicle wall which has a surface interior of a vehicle with an opening to place said second set of tube ends in communication with vehicle interior, said second set of tube ends extending beyond said housing to provide tube extensions of said second tube ends within a vehicle interior, said first set of tube ends being essentially flush with said housing, said mounting means when used on a vehicle exterior wall positioning said tubes to slant them slightly upwardly toward vehicle interior, said gas burner heating said tubes to heat air within and by convection cause the heated air to enter vehicle interior and means for venting combustion products from said gas burner to exterior of said housing.

4,513,912

HOLDING A RAILWAY RAIL DOWN ON A SUPPORT MEMBER

Jon S. Schumaker, Mantua, N.J., assignor to Pandrol Ltd., London, England

Filed Dec. 7, 1981, Ser. No. 328,069
Int. Cl.³ E01B *9/34, 9/46, 9/62*
U.S. Cl. 238—349 **15 Claims**



1. A device for use in holding a railway rail down on a support member, said device comprising a first part for lying in a vertical hole through the support member and a second part at the bottom of the first part, the second part comprising a projection which extends sideways and a part of which is to lie vertically below a part of the support member which is beside the bottom of said hole, said device further comprising a third part at the top of the first part and extending upwardly therefrom, a fourth part extending sideways from the top of the third part and then a fifth part extending downwardly, the first part comprising a fulcrum portion so that when the first part is driven downwardly into said hole the fulcrum portion makes contact with the wall of said hole and forms therewith a pivot about which said device turns to cause said part of said projection to come vertically below said part of the support member, the third, fourth and fifth parts forming an arch under which a first portion of a rail-fastening clip can be driven, which portion will press upwardly on the fourth part of the said device, said device further comprising a sixth part extending sideways from the lowest extremity of the fifth part, the sixth part being for receiving a downwardly pressing second portion of the clip, and a seventh part extending downwardly from the lowest extremity of the fifth part for holding the sixth part above and spaced from the support member, the lowest portion of the seventh part being higher than the lowest portion of the second part, said projection being on one side of said first part, and said fourth, fifth, sixth and seventh parts being on the opposite side of said first part, and the whole of said seventh part being intermediate said first part and that extremity of said sixth part which is remote from said lowest extremity of said fifth part.

4,513,913

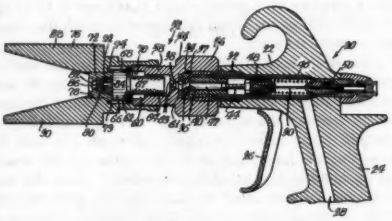
REVERSIBLE AIRLESS SPRAY NOZZLE

David H. Smith, Redwood City, Calif., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Nov. 10, 1982, Ser. No. 440,502
Int. Cl.³ B05B *15/02*
U.S. Cl. 239—119 **6 Claims**

1. A spray nozzle assembly for reversible mounting on an

airless spray gun, comprising an adapter for sealed connection at a rearward end thereof with a forward fluid outlet end of the spray gun, said adapter having external threads at a forward end thereof and a passage therethrough defining a first passage section of a first diameter toward said adapter forward end; annular seal means at said adapter forward end; a cap having a passage therethrough and internal threads in a rearward end of said passage for connection with said adapter forward end, said cap passage forwardly of said threads defining a second passage section of a second diameter and a third passage section forwardly of said second section and having substantially said first diameter, said first diameter being less than said second and said second and third passage sections defining a shoulder therebetween; a spray tip assembly including a generally cylindrical housing having a passage extending axially therethrough and a radially outwardly extending annular flange at a rearward end thereof, and a spray tip in a forward end of said housing passage and having a bore therethrough terminating in a fluid outlet orifice at a forward end of said spray tip, said flange having a diameter greater than said first diameter and the portion of said housing forwardly of said flange having substantially said first diameter, said spray tip assembly in normal spraying position being positioned with said cylindrical



housing portion forwardly of said flange received in said cap third passage section and said flange received in said cap second passage section, said spray tip assembly being reversible for cleaning a blockage from said orifice by a reverse flow of fluid therethrough and when reversed being positioned with said cylindrical housing portion forwardly of said flange received in said adapter first passage section and said flange captured between said shoulder and said seal means; and a filter comprising a cylindrical body of filter material having a diameter less than said first diameter and a cylindrical mounting member at an end thereof, coaxial with and attached to said body of filter material and having a passage therethrough and a diameter greater than said first diameter, said filter, when said spray tip assembly is in normal position for spraying, being positioned with said filter material body extended into said first passage section and said cylindrical mounting member captured between said seal means and a rearward end of said spray tip assembly housing flange with a forward end of said flange abutting said shoulder, said cylindrical mounting member being of a resilient material and forming a seal with said housing flange, and said filter, when said spray tip assembly is in reverse position for cleaning, being removed from said adapter.

4,513,914

INSERTS FOR SQUEEZE BOTTLES

Norman Cook, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,830

Claims priority, application United Kingdom, Oct. 30, 1981, 8132795

Int. Cl.³ B05B *1/28*

U.S. Cl. 239—121 **1 Claim**

1. An insert for a squeeze bottle having a bottle neck with an interior portion, said insert comprising a tubular plug portion engageable in a liquid-tight manner with said interior portion of said bottle neck and a re-entrant diaphragm disposed on said tubular plug portion, characterized in that:

(a) said diaphragm has a circumference and is substantially planar having a substantially tetrahedral re-entrant part recessed therein;

(b) said re-entrant part is formed with a nozzle angled to direct a jet of liquid at an angle of at least 20° to a vertical axis of said plug portion; and

(c) said re-entrant part is defined by two convergent chords wherein said chords meet at said circumference of said diaphragm thereby indicating visually the direction in which said jet of liquid is to be directed.

4,513,915

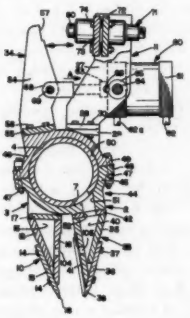
NOZZLE CONSTRUCTION FOR COATING EQUIPMENT

Gordon A. E. Kohler; John B. Kohler, both of North Canton, and Herbert B. Kohler, Greentown, all of Ohio, assignors to The Kohler Coating Machinery Corporation, Greentown, Ohio

Filed Dec. 6, 1982, Ser. No. 447,103

Int. Cl.³ B05B *1/04, 1/32*

U.S. Cl. 239—455 **24 Claims**

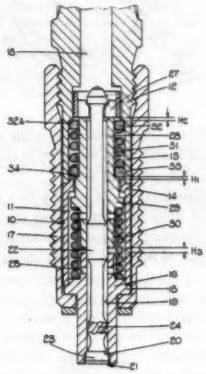


1. An improved fluid nozzle construction for coating equipment including: a transversely elongated nozzle body having a first moveable section, and a second fixed section forming a transversely elongated discharge opening for discharging a stream of fluid on a moving substrate, said second section having a transversely extending hollow conduit providing a fluid supply pipe adapted to be connected to a source of fluid pressure for supplying fluid to the nozzle body for discharge through the elongated discharge opening; pivot means for pivotally mounting the moveable section on the hollow conduit of the fixed section; and a plurality of pressure means mounted on and spaced along the fixed section and acting on the moveable section for moving said section with respect to the fixed section to vary the size of the discharge opening, and to limit and control the deflection of the first section with respect to the second section.

4,513,916
FUEL INJECTION NOZZLE

Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries, Birmingham, England

Filed Sep. 21, 1983, Ser. No. 534,283
Claims priority, application United Kingdom, Oct. 14, 1982, 8229329
Int. Cl.³ F02M 61/08
U.S. Cl. 239—453 2 Claims

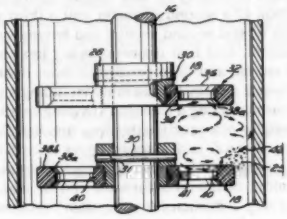


1. A fuel injection nozzle for supplying fuel to an internal combustion engine, the nozzle being of the so-called outwardly opening type and comprising a valve assembly housed within a chamber, a fuel inlet to said chamber, the valve assembly including a valve body defining a bore, a seating defined adjacent one end of the bore, the portion of the bore downstream of the seating defining an outlet opening, a valve member slidable in said bore, the valve member having a head located in said outlet opening and being shaped to co-operate with said seating, a retaining member mounted on the stem of the valve member remote from the seating, a sleeve member mounted about the portion of the stem which extends from the bore, said sleeve member engaging said retaining member, a flange on the sleeve member, a first coiled compression spring acting between said flange and a surface on said body, said first spring acting to bias the head of the valve member into contact with the seating, a pair of annular spring abutments located about said sleeve member intermediate said retaining member and the flange, a second coiled compression spring positioned between the abutments, means defining a step in said chamber to limit the movement of the one spring abutment which is nearer to the valve head, the other spring abutment initially engaging a further step in the chamber, but being engaged by said retaining member during movement of the valve member, said one spring abutment initially engaging a step defined in the sleeve member the axial distance in the closed position of the valve member, between the first mentioned step in the chamber and the one spring abutment being less than the axial distance between the other spring abutment and the retaining member whereby initially the second spring opposes the action of the first spring until the one abutment engages the first mentioned step whereafter the first spring alone acts on the valve member until the other spring abutment is engaged by the retaining member.

4,513,917
SAND MILL ROTOR DISCS

Edward J. Szkaradek, Santa Ana, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.

Filed Jun. 16, 1983, Ser. No. 504,937
Int. Cl.³ B02C 17/16
U.S. Cl. 241—46.11 18 Claims



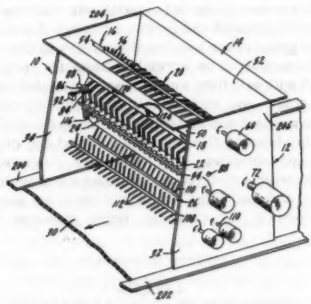
1. Industrial milling apparatus for reducing the size of particles in liquid including a vessel, a rotor in said vessel having a shaft and a plurality of axially spaced rotor discs mounted on the shaft, a quantity of grinding media in the vessel to be agitated by said rotor as the liquid is pumped through the vessel, the improvement wherein:

said rotor discs each have a hub attached to the shaft, a generally planar, annular web extending out from the hub, the web being of substantially uniform thickness throughout its annular shape except for having a plurality of enlarged ports extending axially through the web for permitting the liquid and media to circulate in the vessel, and an annular rim extending outwardly from the web having an uninterrupted and substantially uniform axial thickness considerably greater than the axial thickness of the web.

4,513,918
DISPENSING APPARATUS

Roger F. Parson; Kenneth G. Rosenquist, and Justin M. Schmit, all of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Filed Nov. 12, 1982, Ser. No. 441,174
Int. Cl.³ B02C 19/12
U.S. Cl. 241—101.4 8 Claims



1. An apparatus for uniformly dispensing particulate food materials onto a moving article comprising:

(a) hopper means for holding a supply of the particulate material;

(b) said hopper means having a horizontally-disposed orifice through which particulate material may exit;

(c) a drum mounted adjacent and below said orifice and rotatable on an axis;

(d) a plurality of spaced fins protruding radially from the

surface of said drum and terminating in ends a predetermined distance from the surface of the drum, said fins being disposed on a zigzag pattern relative to the length of said drum and operable to counteract the tendency of the particulate material to fall off the drum;

(e) rotation of said drum in one direction causing particulate material which has compacted on the drum surface between said fins under the force of gravity to be rotated transversely of said opening and out of said hopper; and

(f) scraper means extending parallel to the drum surface below said orifice and adapted to engage said drum surface between said fins;

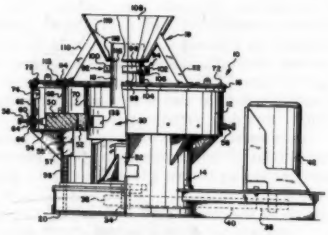
(g) said scraper means being operable to follow the zigzag pattern of said fins and to shift longitudinally of said drum during rotation thereof and effective to lift particulate material compacted in ribbons between said fins off of said surface and guide it to a discharge precipice over which it falls onto the moving article.

4,513,919

FEED ARRANGEMENT FOR A CENTRIFUGAL ROCK CRUSHER

Gabriel M. Terrenzio, Seattle, Wash., assignor to Acrowood Corporation, Everett, Wash.

Filed Nov. 18, 1983, Ser. No. 553,218
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—275 **7 Claims**



1. In a centrifugal impact rock crusher including a cylindrical housing with a vertically disposed central axis, means defining an impact surface positioned radially around the interior of said housing and transverse to said central axis, a housing cover for attachment to said housing having a circular housing feed opening defined therein concentric with said axis, impeller means having a landing surface therein, disposed for rotation concentrically within said housing and adapted to throw rock received upon said landing surface against said impact surface for crushing, and an impeller cover for attachment to said impeller means having a circular impeller feed opening defined therein concentric with said axis and of a diameter substantially equal to the diameter of said housing feed opening, the improvement comprising:

a hopper having at least one side wall with upper and lower edges and defining a circular exit opening at the bottom of said hopper having a diameter substantially equal to the diameters of said housing feed opening and said impeller feed opening;

means supporting said hopper with said exit opening disposed above and concentric with said housing feed opening;

a cylindrical feed tube having upper and lower ends of a diameter slightly less than the diameters of said exit opening, said housing feed opening and said impeller feed opening, and of a height greater than the distance between said exit opening and said impeller feed opening but less than the distance between said upper edge of said hopper side wall and said landing surface of said impeller, said feed tube being disposed in vertical orientation to pass through said exit opening and said housing feed opening and into said impeller feed opening with said upper end within said hopper and said lower end at or below said impeller feed opening; and

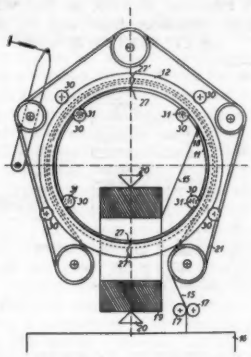
means for releasably securing said feed tube to said housing cover to permit downward adjustment of said feed tube as said bottom end thereof wears.

4,513,920

WINDING MACHINE FOR WINDING ELONGATE MEMBERS OR CORES

Jan B. Pedersen, Bredsten, Denmark, assignor to Tortrix A/S, Vejle, Denmark

Continuation-in-part of Ser. No. 174,496, Nov. 9, 1979, abandoned. This application Aug. 13, 1982, Ser. No. 407,959
Int. Cl.³ H01F *41/08*
U.S. Cl. 242—4 B **12 Claims**



1. A winding unit for use in a winding machine for the winding of a wire on elongate, particularly closed core members, such as toroidal cores, said winding unit comprising:

suspension means for supporting a core member for rotational movement in a first plane;

a substantially annular wire advancing member;

driving means coupled with said wire advancing member;

first individual bearing means for suspending said wire advancing member for rotational movement in a prescribed direction of revolution around its own axis in a plane substantially normal to said first plane and with a substantially circular path of movement encircling said core member;

a substantially annular wire magazine to provide a storage space for taking up wire from an external supply and having cross-sectional width and height dimensions considerably exceeding the diameter of said wire, said wire magazine having an internal side forming the bottom of said storage space and an external side providing an opening for filling wire into said storage space, said internal side having a diameter exceeding the external diameter of the wire advancing member;

second individual bearing means for suspending said wire magazine coaxially with said wire adcancing member with the internal side of the wire magazine extending in radial alignment with an external side of said wire advancing member throughout the axial width of said wire advancing member;

said first and second bearing means allowing said wire magazine to follow the rotational movement of said wire advancing member in said prescribed direction, but independent of the movement of the wire advancing member;

a bottom slit formed in the internal side of the wire magazine throughout the circumferential length thereof with an opening facing said axis for drawing out wire from said storage space simultaneously with the filling of wire into

said storage space through the opening in said external side of the wire magazine;

wire guide means formed on said wire advancing member in substantial radial alignment with said bottom slit; and

means at the external side of the wire magazine to close the storage space of the magazine on part of said external side.

4,513,921

METHOD AND APPARATUS FOR DETECTING FLUCTUATIONS OF MONITORING STANDARD OF THREAD-KNOTTING MONITOR IN AUTO-WINDER

Kinichiro Imoda; Toshinori Kawai, and Kimio Nishitani, all of Nagoya, Japan, assignors to Aichi Spinning Co., Ltd., Japan

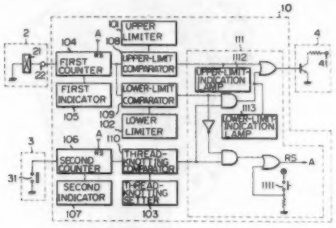
PCT No. PCT/JP83/00198, § 371 Date Feb. 6, 1984, § 102(e) Date Feb. 6, 1984, PCT Pub. No. WO84/00148, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 18, 1983, Ser. No. 582,568

Claims priority, application Japan, Jun. 21, 1982, 57-107370

Int. Cl.³ B65H *54/20, 63/00*

U.S. Cl. 242—36 **5 Claims**



2. An apparatus constructed and arranged to detect fluctuation of a monitoring standard of a thread-knotting monitor in an auto-winder having an automatic thread-knotting machine, said apparatus comprising:

(a) first means for detecting an operation of said thread-knotting monitor;

(b) first means, connected to said first detecting means, for counting the number of operations of said thread-knotting monitor detected by said first detecting means;

(c) second means for detecting an operation of the automatic thread-knotting machine;

(d) second means, connected to said second detecting means, for counting the number of operations of said thread-knotting machine detected by said second detecting means;

(e) means for setting a pre-determined number of thread-knotting operations;

(f) an upper limiter associated with said first counting means and having a pre-determined upper limit number for the number of operations of said thread-knotting monitor relative to the pre-determined number of thread-knotting operations;

(g) a lower limiter associated with said first counting means and having a pre-determined lower limit number for the operations of said thread-knotting monitor relative to said predetermined number of thread-knotting operations;

(h) a thread-knotting comparator associated with said second counting means of said thread-knotting machine and said means for setting a pre-determined number of thread-knotting operations;

(i) an upper limit comparator associated with said upper limiter and said first counting means;

(j) a lower-limit comparator associated with said lower limiter and said first counting means;

(k) means for terminating the operation of the auto-winder; and

(l) means for interconnecting said operation terminating means with said upper-limit comparator and said lower-limit comparator;

said thread-knotting comparator including means for signalling said lower limiter when the number of operations of said thread-knotting machine equals the pre-determined number set by said setting means;

said lower-limit comparator including means for comparing the number of operations of said thread-knotting monitor received by signal from said thread knotting comparator with said pre-determined lower limit number and means for emitting a signal through said interconnecting means to said operation terminating means when said number of thread-knotting monitor operations is less than said pre-determined lower-limit number;

said upper limiter comparator including means for comparing the number of operations of said thread knotting monitor, received by signal from said first counting means, with said pre-determined upper limit number and means for emitting a signal through said interconnecting means to said operation terminating means when said number of operations of said thread-knotting monitor equals said pre-determined upper limit number.

4,513,922

AUTOMATIC MACHINE FOR COILING DOWN CABLE

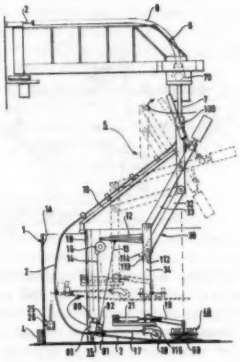
Jacques Dufour, 27 rue Gerschell, 62100 Calais, France

Filed Sep. 20, 1983, Ser. No. 534,057

Claims priority, application France, Sep. 20, 1982, 82 15770

Int. Cl.³ B21C *47/00*

U.S. Cl. 242—54 R **9 Claims**



1. An automatic machine for coiling down successive layers of cable in a cylindrical tank having a vertical axis, the improvement wherein the machine comprises:

a movable beam to enable coiling down to take place in a selected one from a plurality of tanks;

a rotary arm suspended from the beam and rotatable about an axis which is movable by the beam into alignment with the axis of said selected tank;

a parallelogram linkage fixed to the free end of the rotary arm, said parallelogram linkage including a vertically fixed vertical arm connected to the rotary arm and a vertically movable vertical arm linked to the fixed arm;

a cable follower connected to the bottom end of the vertically movable arm by means of a rod articulated thereto; said cable follower being vertically movable by the parallelogram linkage and horizontally movable by said rod; and

a cable tractor supported by the parallelogram linkage and serving to regulate the speed of the cable as a function of the inward or outward direction of spiral winding for any given layer;

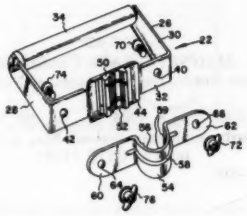
said members being provided with actuator means such as motors and jacks to enable said movements to be remotely controlled, and with position sensors and motion sensors

for sensing data which is applied to a computer for controlling and synchronizing said actuator means.

4,513,923
COMMODE TOILET TISSUE DISPENSER

George Ulics, 1300 Venice, Dearborn, Mich. 48124

Filed Oct. 31, 1983, Ser. No. 547,060
Int. Cl.³ B65H *19/00*; E04G *3/00*
U.S. Cl. 242—55.2 4 Claims



1. Means for mounting a roll of tissue on a commode having a tubular member comprising:

a U-shaped bracket having a pair of spaced legs and an elongated bight;

roller means suitable for supporting a roll of tissue, the ends of the roller means being releasably connected to the bracket legs such that the roller means spans the two legs;

the bight of the bracket having a plurality of longitudinally spaced openings adapted to receive fastener means;

an insert engaging the bight of the bracket and having a pair of bulges received in a first pair of said openings in the bracket, the insert having a groove with a curvature complementing the curvature of the tubular member;

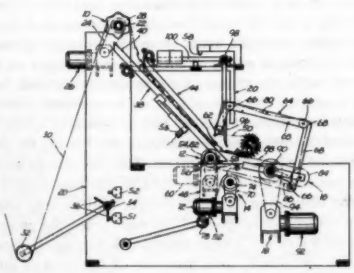
a clamp having a midsection embracing the tubular member, and a pair of ends adjacent a second pair of said openings in the bracket; and

fastener means received in the second pair of openings to connect the clamp to the bight of the bracket.

4,513,924
PROCESS AND APPARATUS FOR PRODUCING ROLLS OF WIRE NETTING

Gerhard Lange, Brahmsstrasse 16, D-7410 Reutlingen 1, and Giovanni T. Angeli, Via Pietro de Crescenzo 32, I-48 018 Faenza (Ravenna), both of Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 416,970
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136207
Int. Cl.³ B65H *17/12, 17/16, 25/04, 25/28*
U.S. Cl. 242—67.2 11 Claims

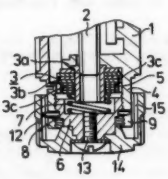


1. Apparatus for automatic production of reelless rolls of an endless web of wire netting formed of flat pressed wire rolls wound into each other comprising several parallel guide surfaces equally inclined to the horizontal, each of which is provided for a row of linking and hooking points of the netting; further comprising several endless winding strands extending in parallel vertical planes along paths which cover each other at least in corresponding sections when projected on each other in a horizontal direction perpendicular to the said vertical planes, each of which strands has a winding portion, a fixed deflecting body, and a displaceable deflecting body, said winding portion adjoining the guide surfaces and extending from said fixed deflecting body to said displaceable deflecting body which is displaceable relative to the fixed deflecting body, said winding portion and corresponding winding portions of the other winding strands which lie in a cylindrical surface with horizontal generatrix, together forming a receiver of variable form and size for the roll; also comprising at least one rocking holder for the displaceable deflecting bodies; and comprising a strand driving device for displacing the winding strands along their paths, the strand driving device acting without slippage on each winding portion by means of a strand driving wheel; characterized by a winding driving device for shortening the winding portions during the winding operation by means of a winding driving wheel acting without slippage on each winding strand outside its winding portion, which winding driving wheel is rotatable in the same sense and at a lower circumferential speed than the strand driving wheel which acts on the same winding strand; further characterized by a plurality of endless transport strands which extend in parallel vertical planes along paths which cover each other at least in sections, each of said strands having a transport portion with a beginning section adjoining one of said guide surface, at least the beginning sections of the transport portions lying in the aforesaid cylindrical surface; and by a transport driving device for transport of the roll during a lengthening of the winding portions, said transport being effected by a transport driving wheel acting without slippage on each transport portion.

4,513,925
DRAG BRAKE DEVICE FOR SPINNING REEL

Nobuyuki Yamaguchi, Tokyo, Japan, assignor to Daiwa Seiko Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,976
Int. Cl.³ A01K *89/02*
U.S. Cl. 242—84.5 A 1 Claim



1. In a spinning reel of the type having a brake member fitted at the rear of a spool-sliding shaft, and an adjustment member retractably screwed into the inside of a cylinder projecting from a housing around the outer periphery of said brake member and pressed into contact with said brake member via a resilient member so as to control the slippage of said spool-sliding shaft, a drag brake device for a spinning reel characterized in that an engagement portion and a through-hole are defined at an end portion of said cylinder opposite to each other, base ends of an annular spring fitting into said cylinder engaged with said engagement portion, a protuberance formed at the center of said annular spring fits into said through-hole, an anchoring step portion for said annular spring is formed at an end of a screw portion of said adjustment member, a knob cylinder positioned over the outer circumferential surface of said cylinder is attached integrally to said adjustment member,

and corrugations for engaging said protuberance of said annular spring are defined axially along an inner circumferential surface of said knob cylinder.

4,513,926

BAIL ARM CONTROL DEVICE FOR A SPINNING REEL

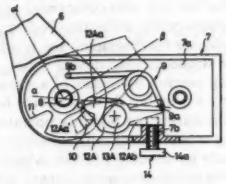
Kikuo Tsunoda, and Takehiro Kobayashi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed May 4, 1982, Ser. No. 374,657

Claims priority, application Japan, May 5, 1981, 56-68030; May 5, 1981, 56-68031

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **9 Claims**



1. In a bail arm control device for a fishing line having a housing, a bail arm, a bail arm lever carrying one end of said bail arm with said lever being pivotally supported on said housing for rotation between a winding position and a casting position, and a torsion spring having a dead point for biasing said lever to said positions which are located on the opposite sides of the dead point of said torsion spring, the improvement comprising a first stop boss provided on said bail arm lever, a second stop boss on said housing adapted to be engaged by said first stop boss when said bail arm lever is pivoted to said casting position and adjustable stop means, means for moveably mounting said stop means in said housing for engagement by said first stop boss when said bail arm lever is pivoted to said winding position whereby the position of said bail arm lever may be adjusted to compensate for wear in said bail arm control device.

4,513,927

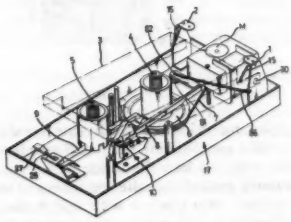
REWINDING APPARATUS FOR VIDEO CASSETTE

Yeh C. Tsai, No. 6, Lane 308, Pao-Shan Rd., Hsinchu City, Taiwan

Filed Aug. 8, 1983, Ser. No. 520,997

Int. Cl.³ G03B *1/02*; B65H *59/38*; G11B *15/13*

U.S. Cl. 242—191 **2 Claims**



1. An improved tape rewinding apparatus for a video cassette including a frame, a cassette compartment lid having an end pivoted at said frame, and a winding spindle driven by a transmission belt, the apparatus comprising:

a catch member disposed at said cassette compartment lid for fastening said cassette compartment lid in closed position;

a controlling member pivoted at said frame for controlling the release of said catch member, including a free end;

a spring member; and

a tension sensing member, biassed by said spring member to abut against said transmission belt and being moved in bias direction to actuate said free end of said controlling member to release said catch member in response to the decrease of tension of the transmission belt when the winding spindle is hindered from rotating.

4,513,928

MAGNETIC TAPE CASSETTE

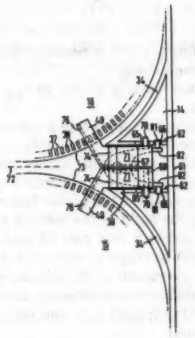
Joseph Hackett, Dublin, Ireland, assignor to Eko Video Limited, Ireland

Filed May 5, 1983, Ser. No. 491,747

Claims priority, application Ireland, May 6, 1982, 1086/82

Int. Cl.³ G11B *15/32*

U.S. Cl. 242—198 **7 Claims**

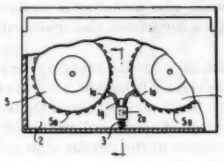


1. A tape cassette for use in a magnetic recording/reproducing apparatus, the cassette being of the kind comprising a housing having top and bottom plates with a pair of tape reels rotatably accommodated side-by-side in the housing between the said plates, a pair of spaced apertures in the bottom plate permitting entry into the housing of a pair of reel-engaging shafts of the said apparatus when the cassette is inserted into its position of use in the apparatus, and locking means automatically effective when the cassette is removed from the apparatus for substantially preventing inadvertent rotation of the reels when the cassette is not in its position of use, the locking means comprising a plurality of recesses formed on the outside surface of one flange of each tape reel adjacent the peripheral edge thereof, a pair of locking levers independently pivoted side-by-side about a common pivoted axis, said pair of locking levers having a pair of brake members, one on each locking lever extending mutually away from one another across the respective peripheral edges of the tape reel flanges each for engagement with any recess of a respective tape reel, means pivotally mounting the pair of locking levers with respect to the housing for rotation about an axis non-parallel to the rotational axes of the tape reels, means resiliently biasing the pair of levers for rotation in such a direction about the pivotal axis that the brake members are brought towards the said outside surfaces of the respective tape reel flanges into locking engagement with respective recesses of the reels when the cassette is not in its position of use, and an aperture in the cassette housing for a release pin which upon insertion of the cassette into its position of use in the apparatus is operative to rotate the pair of levers in opposition to the resilient biasing means to disengage the brake members from the tape reels, whereby each locking lever comprises a respective brake member.

4,513,929
MAGNETIC TAPE CASSETTE

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1983, Ser. No. 494,470
Claims priority, application Japan, May 13, 1982, 57-68716[U]
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—198 2 Claims

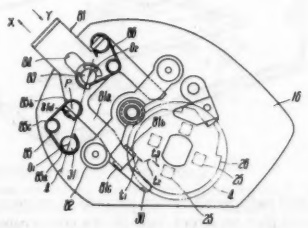


1. A magnetic tape cassette comprising a pair of reels rotatably mounted in said cassette with each reel having a geared peripheral portion, a brake member slidably mounted in said cassette for selectively engaging said gears to stop rotation of said reels and a brake releasing bar insertion hole located in a portion of said cassette adjacent said brake member, said brake member being comprised of a cover portion having a blind bore therein slidably engaging said cassette with said blind bore in communication with said hole whereby the inside of said cassette is isolated from the outside environment and a pair of end portions extending from said cover portion for engaging the geared peripheral portion of the respective reels.

4,513,930
FISHING REEL

Jun Sato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 374,742, May 4, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,266
Claims priority, application Japan, May 22, 1981, 56-78503
Int. Cl.[3] A01K *89/02*
U.S. Cl. 242—218 7 Claims

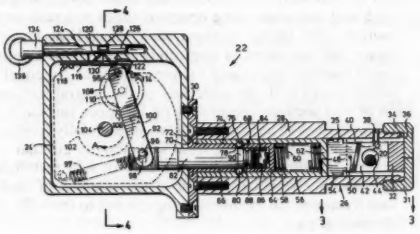


1. A fishing reel comprising,
a body frame,
a spool journalled to said frame and having a spool shaft,
a drive mechanism driving said spool and having a handle,
a clutch for interrupting a driving force transmitted from said drive mechanism to said spool, and
a clutch operating mechanism comprising a clutch lever which operates to disconnect said clutch, and return protuberances which rotate together with said handle to return said clutch lever to thereby connect said clutch, said clutch lever at said operating mechanism being supported to said frame in relation of being forwardly and backwardly movable and swingable around an axis which is parallel to a rotation axis of said return protuberances, said clutch lever for disconnecting said clutch having, at an utmost end in the direction of forward movement thereof an engaging portion which is non-movable relative to said clutch lever and which is engageable with each of said return protuberances, said clutch operating mechanism further comprising a torsion spring which biases said clutch lever in the swinging direction thereof and inverts the direction of biasing said clutch lever, during its forward movement, from moving said engaging portion away from each of said return protuberances to moving said engaging portion toward each of said return protuberances, and a restriction means for restricting a range of swinging motion of said clutch lever and comprising a guide groove having a width and a guide piece entering said groove, said torsion spring and restriction means coacting so that said engaging portion, when said clutch lever moves forwardly, is moved by action of said torsion spring on said lever step-wise radially inwardly from the radial outside with respect to each of said return protuberances, placing said engaging portion in the path of movement of said protuberances.

4,513,931
DEREEFING CUTTER

E. Dennis Kenzie, Fort Erie, Canada, assignor to Aero-Safe Technologies Inc., Fort Erie, Canada

Continuation of Ser. No. 212,182, Dec. 2, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,220
Int. Cl.[3] B64D *17/36*
U.S. Cl. 244—152 20 Claims

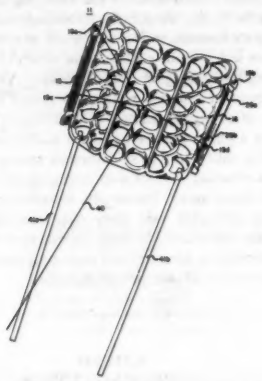


20. A dereefing cutter for a parachute comprising a housing, an aperture in said housing to receive a reefing line, a knife to sever said reefing line and positioned to one side of said aperture, biasing means to bias said knife toward and across said aperture to sever a reefing line located in said aperture, latch means to oppose said biasing means and retain said knife to said one side, said latch means including a detent member slidably supported by a fixed member associated with said housing and operable upon a moveable member associated with said knife means, to hold said moveable member in a latched position against said biasing means, release means to release said latch means and permit movement of said knife means by said biasing means, said release means being operable to permit relative movement between said detent member and said fixed member to move said detent member out of latching engagement with said moveable member to permit relative movement, under the influence of said biasing means between said detent member and said moveable member, said release means including a release member moveable relative to said detent member from a first position in which said detent member prevents movement between said fixed and moveable members to a second position in which said detent member permits such relative movement, movement of said release member from said first to second position being in a direction opposite to that imparted to said moveable member by said biasing means.

4,513,932
RIGID MULTI-CONE KITE

Betty B. Sinha, 482 Madison Ave., Toms River, N.J. 08753

Filed Jun. 30, 1983, Ser. No. 509,343
Int. Cl.[3] B64C 31/06
U.S. Cl. 244—153 R 9 Claims



1. A lite comprising in combination three substantially identical rectangular sections of foam-like material comprising in combination:

a central section;

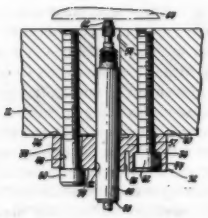
a pair of symmetrically disposed lateral sections contiguous with and extended along opposite edges and said central section, said lateral sections each being bent inwardly along said junctions at oppositely directed substantially equal internal angles and forming substantially equal external angles with the underside of the central section;

each of said sections comprising on its upper surface a plurality of rows of adjacent, hollow, substantially frustoconical members protruding from substantially circular concentric openings at the base of each of said members, a substantially identical portion of the sidewall of each of said frustoconical members being cut out to form an aerodynamical cup.

4,513,933
TRANSDUCER CLAMPING DEVICE

Willi H. Lueders, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1983, Ser. No. 505,178
Int. Cl.[3] G12B 5/00
U.S. Cl. 248—27.1 1 Claim



1. A clamping device adapted for use with a flow-through gage or the like to releasably mount and fixedly position a transducer probe having a tubular stem relative to the body of said flow-through gage or the like, comprising:

a block member having a first end rigidly attached to a surface of the gage body and a second end normally spaced from the surface of the gage body by a predetermined amount,

the block member further including a tunnel therethrough between the first and second ends normaliy axially aligned with a tunnel through the gage body, the wall of the gage body tunnel closely confining the tubular stem of the transducer probe, and the wall of the block tunnel being normally radially spaced from the tubular stem by a predetermined amount,

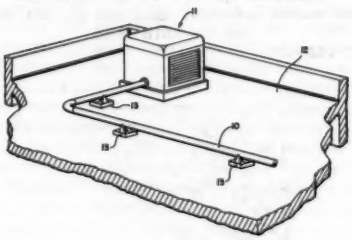
the block member also including a weakened portion between the block tunnel and the rigidly attached first end, and

tightening means in one mode engaging the second end with the gage body surface from which it is normally spaced by deforming the block member about the weakened portion causing a controlled axial misalignment of the block member tunnel relative to the tubular stem sufficient to bring the wall of the block member tunnel into clamping engagement therewith to fixedly position the probe relative to the gage body with the pressure holding said probe being absolutely controlled and predetermined by the engagement of the normally spaced second end with the gage body surface, the tightening means in another mode restoring the normal spacing of the second end from the gage body surface and the normal axial alignment of the tunnels to release the probe from the gage body.

4,513,934
PIPE-SUPPORTING DEVICE

Jerry R. Pruyne, Salt Lake County, Utah, assignor to Miro Industries, Inc., Midvale, Utah

Filed Nov. 3, 1982, Ser. No. 438,735
Int. Cl.[3] F16L 3/00
U.S. Cl. 248—49 12 Claims

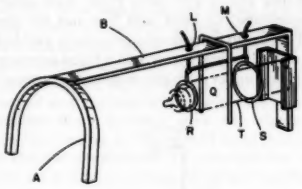


1. A pipe supporting device adapted to receive and support an exposed pipe on a roof, said device comprising a base having a flat bottom for resting on the roof; and upwardly tapered structure secured on and rising from said base to provide an upwardly divergent, substantially V recess having divergent line contacts for receiving the pipe and supporting it above said base, said line contacts minimizing contact area and friction between the pipe and said device, and said structure being made up of wall means, parts of which divergently recede from the respective line contacts at opposite arms of the V to provide mutually opposite, upwardly tapered towers, other parts of which slope upwardly from said base toward and meeting with the lower ends of said receding wall parts between said line contacts, and still other parts of which join the receding wall parts of the respective towers, said other wall parts and said still other wall parts having lower ends forming a symmetrical periphery at said base which substantially evenly distributes the pipe load on the base and on the roof.

4,513,935
NURSING BOTTLE SUPPORT

Everado M. Aguirre, LaPerpetua 1688 Del Country S.H.J., Guadalajara 2, Jalisco, Mexico

Filed Feb. 28, 1983, Ser. No. 433,820
Claims priority, application Mexico, Jan. 4, 1982, 190732
Int. Cl.[3] A47B *15/00*
U.S. Cl. 248—105 3 Claims

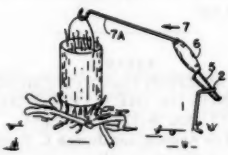


1. A nursing bottle support comprising a tripod consisting of a bar intended normally to extend in a generally horizontal plane, an arcuate member at one end of said horizontal bar providing two spaced apart legs as a part of said tripod and a vertically extending member at the other end of said bar providing a third leg of said tripod, a pair of spaced holes in said bar adjacent said third leg for receiving a pair of flexible members, a bottle holding support and a pair of flexible members attached to said bottle holding support and extending through said holes, and a U-shaped member extending over said bar and downwardly therefrom to engage the sides of a nursing bottle and limit the movement thereof.

4,513,936
ADJUSTABLE SUPPORT FOR COOKING POTS AND THE LIKE

Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Filed Mar. 25, 1983, Ser. No. 478,685
Int. Cl.[3] F16L *3/00*
U.S. Cl. 248—122 17 Claims



1. An adjustable support, comprising:

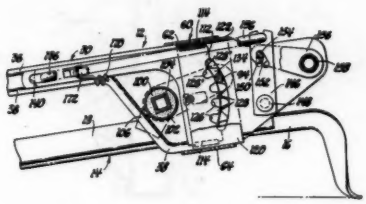
a first member having means for supporting itself on a level base surface and comprising a flat holding portion and means for holding said flat portion spaced up from said base surface, said flat portion having an opening defined by edges which are oriented in a generally horizontal position within the plane of said flat portion, and

a second member, said second member being elongated in shape and unattached so that it is freely moveable, one end thereof comprising a tapered section, the wider end of said tapered section being wider than the maximum dimension of said opening of said holding portion, said tapered section having oppositely-facing tapered edges and said tapered section and said opening being sized and shaped so that said tapered section can be partially inserted into said opening and tilted to one side so that it can be positioned in any of a range of angular positions in said opening with its oppositely-facing tapered edges in contact with the opposite edges of said opening, such that said second member will be self supporting in any of a range of positions when its tapered section is placed in said opening and such that the height of the opposite end of said tapered portion can be adjusted, said second member having means for holding a workpiece at its other end.

4,513,937
VERTICAL SEAT ADJUSTER ARRANGEMENT FOR VEHICLE SEATS

Otto J. Langmesser, Jr., Fraser, and Richard W. A. Rees, West Bloomfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1982, Ser. No. 438,964
Int. Cl.[3] F16M *11/24, 13/00*
U.S. Cl. 248—394 3 Claims



1. A seat support mechanism for mounting a vehicle seat on a vehicle for vertical adjustment thereof relative to the vehicle comprising, in combination,

a seat support bracket secured to the seat and including a vertical extending arcuate slot therethrough,

pivot means fixable relative to the vehicle and extending to opposite sides of the bracket through the slot thereof,

a lever rotatably secured to the seat support bracket and to the pivot means, rotation of the lever about the pivot means vertically adjusting the seat support bracket,

a pair of lock plates, each including a plurality of vertically successive detent means spaced by intervening abutment means,

the detent means and abutment means of one lock plate being vertically offset from those of the other lock plate whereby a detent means of one lock plate is horizontally aligned with a corresponding abutment means of the other lock plate,

guide means mounting a lock plate on each side of the support bracket for horizontal sliding movement between a locked position wherein one of the detent means engages the pivot means to lock the seat support bracket against movement relative to the pivot means and a released position wherein one of the abutment means engages the pivot means to block engagement of the detent means with the pivot means,

means biasing both lock plates toward the pivot means to engage a detent means of one lock plate and an abutment means of the other lock plate with the pivot means and thereby locate the one lock plate in locked position and the other lock plate in released position,

an operator,

pin and slot means connecting the operator to the lock plates,

the pin and slot means being engaged between the operator and the one lock plate in locked position and being disengaged and freely slidable between the operator and other lock plate in released position whereby movement of the operator moves the one lock plate from locked position to released position while the other lock plate remains in released position.

4,513,938

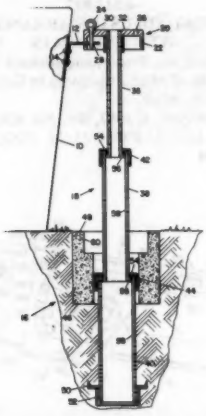
RETRACTING REFUSE CAN SUPPORT

Charles M. Seymour, 1581 Oak Rd., Simi, Calif. 93063

Filed Aug. 28, 1981, Ser. No. 297,248

Int. Cl.³ A47B *97/00*

U.S. Cl. 248—507 **11 Claims**



1. A retractable apparatus for holding garbage or refuse cans in an erect position comprising:

hollow casing means for location in the ground and having an upper surface substantially flush with ground level;

support column means normally contained in said casing substantially flush with the upper surface of said casing means and with ground level, but extended to a firm upright position above ground;

means for releasably securing garbage or refuse cans to said support column means; whereby they are firmly held in an upright position and overturning by scavengers or the elements is precluded; and

said means for releasably securing garbage or refuse to said support column means including at least one horizontally disposed and outwardly extending blade attached near the top of a garbage or refuse can, a head fixture secured to said support column means, said head fixture having at least one horizontally oriented slot for receiving said blade, and means for releasably locking said blade within said slot.

4,513,939

VIBRATION ABSORPTION MOUNTING FOR A ROOFTOP AIR HANDLING UNIT

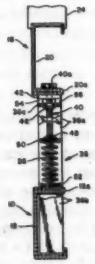
Richard C. Berger, Off Split Rock Rd., Syosset, N.Y. 11791, and Paul L. Berger, 28 Moss La., Jericho, N.Y. 11753

Filed Oct. 11, 1983, Ser. No. 540,511

Int. Cl.³ E02D *27/44*; F16M *9/00*; E04B *1/36*

U.S. Cl. 248—544 **3 Claims**

1. An improved pre-assembled vibration absorption system for a rooftop mounted air handling unit comprising, in combination, a rectangular shaped upper curb adapted to have in attached relation thereto said air handling unit, plural bolts each bolted to extend in depending relation from said upper curb at selected locations therealong, a rectangular shaped lower curb adapted to be mounted on said rooftop in supporting relation beneath said upper curb, and at each location of one said depending bolt an inverted U-shaped housing attached to said lower curb bounding a compartment for a spring and having an opening in the top thereof through which said depending bolt has an operative position projected into said compartment, a first nut threadably engaged to said bolt in said compartment adjacent the underside of said top of said housing having an initial operative position bolting said housing to said upper curb such that said upper and lower curbs are correspondingly bolted to each other to facilitate the transit thereof to a rooftop site, a compressible helical spring disposed in each said compartment in surrounding relation about a cooperating depending bolt, and a second nut positioned beneath said first nut and downwardly adjustable along said bolt so as to cause compression of said spring and a corresponding increase in the upward force urgency therein, whereby following the unbolting of said upper and lower curbs from each other by the threadable adjustment of each said first nut the threadable adjustment of each said second nut down along said bolt causes compression of said helical spring and a force urgency therein effective to lift said upper curb into a spaced clearance position



above said lower curb, to thereby permit vibrating movement of said upper curb relative to a stationarily mounted lower curb.

2. The improved pre-assembled vibration adsorption system as claimed in claim **1**, including unattached spacing blocks that are released for removal upon the threaded adjustment of each said second nut, to thereby contribute to enlarging the clearance provided for vibratory movement of said upper curb in relation to said lower curb.

3. The improved pre-assembled vibration absorption system as claimed in claim **2**, including weather shields attached about said interconnected upper and lower curbs and having access openings therethrough for making threadable adjustments in each said second nut.

4,513,940

MEANS AND METHOD FOR ATTACHING FAN AND FIXTURE UNITS OR THE LIKE SUBSTANTIALLY FLUSH WITH A CEILING

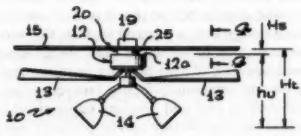
Marvin Alperin, Los Angeles, and Joseph L. Brasswer, Tarzana, both of Calif., assignors to Albrass Enterprises, Inc., Los Angeles, Calif.

Continuation of Ser. No. 370,749, Apr. 22, 1982, Pat. No. 4,410,160. This application Oct. 14, 1983, Ser. No. 542,107

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.³ F16M *1/00*

U.S. Cl. 248—674 **2 Claims**



1. In a ceiling terminal which includes a largely cylindrical ceiling bowl member having a lower rim and fastened close to a ceiling, and a second largely cylindrical bowl member of about the same diameter, and with an upper rim to mate with

the ceiling member by one member closely fitting within the other, the improvement wherein:

one bowl member has a plurality of slots spaced about its rim, and the other bowl member has a plurality of projections that pass along said slots when said bowl members mate;

each of said slots has a first portion extending primarily vertically and having an outer end forming an opening in the rim of the slotted member and an inner end spaced from its rim, a second slot portion extending primarily horizontally from said inner end of said first slot portion and said second slot portion having an inner end opposite said first slot portion, and a third slot portion extending in a largely vertical direction from said inner end of said second slot portion and having an inner end furthest from the second slot portion, whereby a workman can install the second bowl member with any electrical device thereon by pressing up the second bowl member until he senses that the projections have reached the inner end of the first slot portions, turning the second member until the projections reach the inner end of the second slot portions, and then releasing the second member to move down slightly to move the projections to the inner ends of the third slot portions.

4,513,941

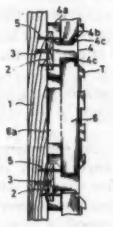
TILE HOLDING DEVICE FOR PRESETTING TILES

Masaharu Yamaguchi, Suita, Japan, assignor to Iwao Jiki Kogyo Kabushiki Kaisha, Saga, Japan

Filed Oct. 21, 1983, Ser. No. 544,302

Int. Cl.³ B32B *3/08, 23/22*

U.S. Cl. 249—91 **3 Claims**



1. A tile holding device for presetting tiles comprising a plurality of strip-shaped core members **2** attachable to the inner surface of a form panel **1** as arranged in parallel at a required spacing, a plurality of long joint members **4** made of elastic material and each mountable on the core member **2**, and a plurality of short joint members **6** made of elastic material and to be arranged between and joined to each two adjacent long joint members.

4,513,942

PLATE MOLDING APPARATUS WITH INTERLOCKING CAVITY PLATES

Edwin A. Creasman, Fontana, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed May 25, 1983, Ser. No. 497,982

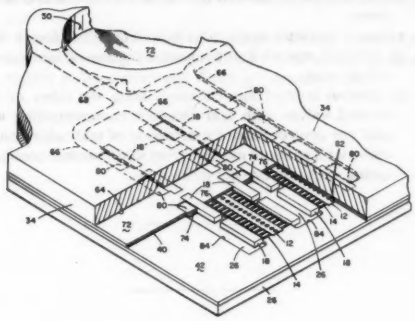
Int. Cl.³ B22D *19/04*

U.S. Cl. 249—95 **20 Claims**

1. An improved cavity plate assembly for an apparatus for encapsulating lead frame-mounted objects in molded packages of the type having first and second opposed mold plates with first and second molding surfaces, respectively; cavity plate means removably positionable between said first and second mold plates and having an array of multi-sided cavities in which said objects are held in a fixed position relative to and apart from said molding surfaces; passage means in said first mold plate for allowing the passage of liquid encapsulation material to said first molding surface; and channel means, in said first molding surface and in said cavity plate means, for communicating between said passage means and each of said cavities, whereby said liquid encapsulation material can be injected into said cavities via said passage means and said channel means, wherein the improvement comprises:

a first cavity plate having first and second opposed surfaces, said first surface being positionable against said first molding surface;

a plurality of elongate, flat-surfaced projections extending from said second surface of said first cavity plate;



means within said projections defining said array of cavities, all but one side of each of said cavities being defined by integral surfaces within one of said projections; and

a second cavity plate having a plurality of elongate slots therethrough, said slots located and dimensioned to register with and receive said projections;

whereby the remaining side of each of said cavities is defined by a mating surface formed by the juncture of said first and second cavity plates at the edge of one of said slots when said first and second cavity plates are fitted together with said projections received in said slots.

4,513,943

PRESSURE MEDIUM ACTUATED SERVO-MOTOR SYSTEM

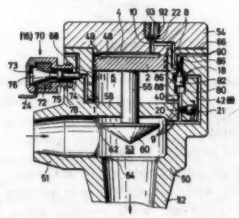
Steffen P. Russak, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 13, 1983, Ser. No. 531,702

Claims priority, application Switzerland, Sep. 17, 1982, 5510/82

Int. Cl.³ F16K *31/122;* **F15B** *13/043*

U.S. Cl. 251—31 **11 Claims**



1. A pressure medium actuated servomotor system comprising

a cylinder;

a piston slidably mounted in said cylinder to divide said cylinder into two chambers;

a first line communicating one of said chambers with a pressure medium source;
a second line communicating said one chamber with a pressure medium sink;
a third line communicating the other of said chambers with said pressure medium source;
a fourth line communicating said other chamber with said pressure medium sink;
a first control valve in one of said first and said second lines;
a first restrictor in the other of said first and said second lines;
a second control valve in one of said third and said fourth lines;
a second restrictor in the other of said third and fourth lines;
an external control line connected to one of said control valves; and
an internal control line communicating the other of said control valves with said chamber communicating with said one control valve for actuation of said other control valve with pressure medium from said chamber communicating with said one control valve.

4,513,944

VALVE WITH LATCHING MEANS

James B. Adams, Jr., Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 289,818, Aug. 3, 1981, abandoned, which is a division of Ser. No. 156,200, Jun. 3, 1980, Pat. No. 4,378,931. This application Jul. 19, 1984, Ser. No. 632,321

Int. Cl.³ F16K *31/00*

U.S. Cl. 251—89 **6 Claims**

1. A valve comprising,
a tubular housing,
a tubular valve actuator in said housing,
means for reciprocating said valve actuator,
a valve member and cooperative seat moving between open and closed positions with reciprocation of said valve actuator,
means for mechanically latching said valve member in open position while leaving said actuator free to reciprocate in response to movement of said actuator beyond its normal travel range in moving the valve member between open and closed positions.

4,513,945

ELECTROMAGNETIC REED VALVE

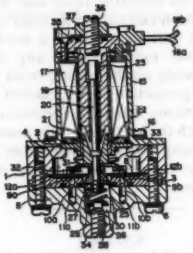
Hiromi Otsuki, Anjo; Takashi Kondo, Toyota; Yoshiaki Kondo, Kariya; Haruyuki Obata; Takao Tate, both of Susono, and Norikatu Ishikawa, Mishima, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 10, 1982, Ser. No. 416,693

Claims priority, application Japan, Sep. 14, 1981, 56-136602[U]

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—129 **1 Claim**



1. An electromagnetic reed valve comprising:
a housing defining therein a valve chamber, said housing including an inlet port through which fluid flows into the valve chamber and an outlet port through which fluid flows out of the valve chamber;
a reed valve body provided in the valve chamber capable of opening the outlet port of said housing, said reed valve body being secured at one end thereof and being free at the other end thereof;
a solenoid provided in said housing for varying the magnetic force thereof in response to the value of a current applied thereto;
a plunger moved at a stroke responsive to the magnetic force produced by the energization of said solenoid, said plunger having a lifter engaged with the free end of said reed valve body when said solenoid is energized so that the outlet port is opened in response to the stroke and disengaged from the free end of said reed valve body when said solenoid is deenergized so that the outlet port is closed; and
pressing means for urging that portion of said reed valve body which confronts at least the output port when said solenoid is deenergized, said pressing means including a pressing member mounted at said plunger, capable of contacting with that portion of said reed valve body which confronts at least the outlet port thereof, and a first urging member for pressing said pressing member in contact with said that portion of said reed valve body when said solenoid is deenergized, said solenoid moving said plunger against the urging force of said first urging member when said solenoid is energized whereby the outlet port is opened, said first urging member including a first coil spring engaged at one end thereof with said housing and engaged at the other end thereof with said pressing member.

4,513,946

VALVE AND VALVE SEALING MEMBER

Werner K. Priese, Barrington, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

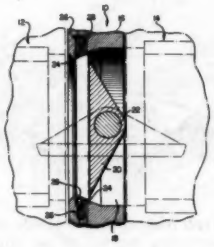
Filed Jul. 12, 1982, Ser. No. 397,147

Int. Cl.³ F16K *1/228*

U.S. Cl. 251—173 **6 Claims**

1. A valve comprising, in combination; a first element constituting a valve body and defining a flow passage extending

therethrough, a second element constituting a flow control member movably supported relative to said body for movement between an open position and a closed position for opening and closing said flow passage, one of said elements defining an annular sealing surface, and the other of said elements defining an annular sealing member support groove oriented to confront said sealing surface, an annular sealing member disposed in said support groove, said sealing member having a base section held in said support groove, and a sealing portion



confronting said sealing surface for sealing engagement therewith, an intermediate section of metallic material joining said base section and said sealing portion including, a plurality of convolutions of decreasing thickness in the direction of said sealing portion so as to approximate a beam with uniform stress, for enabling said intermediate section to flex without permanent deformation while distributing stress in the convolutions substantially uniformly when the sealing member is in engagement with the sealing surface.

4,513,947

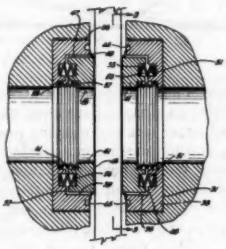
GEOTHERMAL VALVE

William E. Amend, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 18, 1983, Ser. No. 514,979

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—174 **6 Claims**



1. A valve for controlling the flow of geothermal brines, which comprises:

(a) a valve body defining a valve chamber and cylindrical inlet and outlet flow passages intersecting said valve chamber, said valve body further defining annular seat recesses about the intersection of said inlet and outlet flow passages and said valve chamber, each of said annular seat recesses being defined by a cooperative radial surface and a cylindrical surface,

(b) a gate element comprised of carbon steel having a cobalt alloy face and being movably positioned within said valve chamber and being movable between open and closed positions to control the flow of fluid through said flow passages;

(c) an annular ring being movably retained within each of said seat recesses and having a cobalt alloy sealing surface for establishing sealing engagement with said gate element and a rear surface opposing said radial surface, said annular ring having an outside surface conforming to said cylindrical surface and an inside surface conforming to the flow passage;

(d) at least three helical compression springs seated in cavities equi-axially spaced about said annular ring to resiliently urge said sealing surface against said gate element;

(e) a first flexible metal seal configured as an accordian-shaped member and secured to said valve body and the said inner surface, said metal seal being a high nickel alloy; and

(f) a second flexible metal seal secured to said valve body and said sealing surface, whereby said spring is fluid-tightly isolated from said flowing corrosive fluid.

4,513,948

DIAPHRAGM REGULATING VALVE

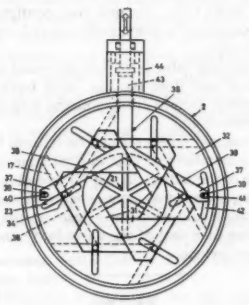
Reinhard König, Altenbergstrasse 27, 7520 Bruchsal 7, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,757

Claims priority, application Switzerland, Jan. 14, 1981, 222/81

Int. Cl.³ F16K *3/03*

U.S. Cl. 251—212 **16 Claims**



1. A diaphragm regulating valve for regulation of the flow of a fluid medium comprising: a plurality of flat diaphragm elements having contact edges in mutual contact; a housing, including two housing halves, defining a flow channel; said diaphragm elements arranged for insertion into said flow channel, and actuatable by at least one catch ring also mounted in the housing; at least one of the housing halves being provided with supporting ribs projecting into said flow channel and forming a star having a shape generally defined by the contact edges of said elements in said flow channel when the valve is closed, and said ribs fully covering the contact edges of said diaphragm elements in said flow channel when the valve is closed, the diaphragm being forced against the supporting ribs by fluid pressure.

4,513,949
VALVE ASSEMBLY

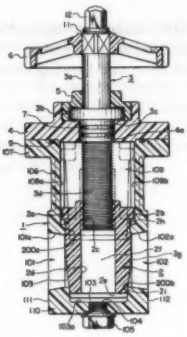
Tomoyuki Ueda, and Hirotoshi Ogawa, both of c/o Asahi Yukizai Kogyo Co., Ltd., of 5955, Nakanose-cho 2-chome, Nobeoka-shi, Miyazaki-ken, Japan

Continuation-in-part of Ser. No. 326,010, Nov. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 177,613, Aug. 13, 1980, abandoned. This application Dec. 15, 1983, Ser. No. 561,699

Claims priority, application Japan, Aug. 13, 1980, 55-45998

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—266 4 Claims



1. A valve assembly comprising in combination a valve body made of a hard synthetic resin preferably PVC and having a fluid passage laterally arranged therethrough;

a non-rotatable, axially bored valve member made of a hard synthetic resin softer than that of the valve body and movable within the valve body perpendicular to said fluid passage and holdable at any position at and between a full-closing position and a full-opening position relative to said fluid passage, said valve member taking a general imaginary shape close to a true cylinder and having a taper of 1/10–1/30, the practical configuration thereof being generally of a convexedly curved one in the direction of its taper;

a pair of separated valve seats formed in said valve body unit and around said fluid passage, each having a generally tapered planar surface corresponding with the taper of the valve member; and

a shallow concave recess formed on bottom wall surface of said valve member and kept in fluid connection with said axial bore of the latter adapted for avoiding fluid trapping which may otherwise occur when said valve member is being brought into its closing position; the material resin being softer than that of the valve body unit and preferably polypropylene.

4,513,950
GARAGE JACK FOR LIFTING AN AUTOMOBILE

Takeshi Yamagishi, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Japan

Filed May 13, 1983, Ser. No. 494,165

Claims priority, application Japan, Mar. 24, 1983, 58-47889

Int. Cl.³ B60P *1/48*

U.S. Cl. 254—8 B 7 Claims

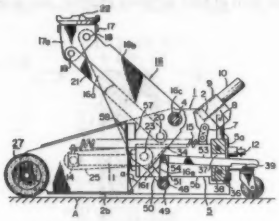
1. A garage jack for lifting an automobile provided with an arm lock mechanism for preventing inadvertent fall of a lifting arm, comprising:

a rotatable shaft which is provided with a first pawl and a second pawl in an angularly displaced relation;

a lock/unlock bar which may be selectively secured to a position to put the first and the second pawls out of their functions;

a first engagement means provided on the rear end of the lifting arm to prevent the fall of the lifting arm below a first position by engaging with the first pawl; and

a second engagement means provided on the lifting arm comprising of a pair of substantially triangular side plates, a top plate extending between the top ends of the two side plates and is rotatably supported by a tubular collar attached to a rear portion of each of side plates of the lifting arm for preventing the fall of the lifting arm below a second position by engaging with the second pawl;



said rotatable shaft carrying the first and the second pawls being normally biased by a spring means to their active states.

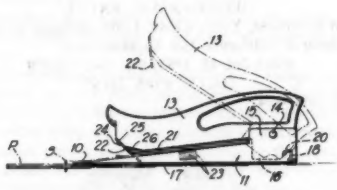
4,513,951
STAPLE REMOVER

E. Mark Rogers, 3052 Kingstowne Club Dr., Smyrna, Ga. 30080

Filed Mar. 12, 1984, Ser. No. 589,178

Int. Cl.³ B25C *11/00*

U.S. Cl. 254—28 10 Claims



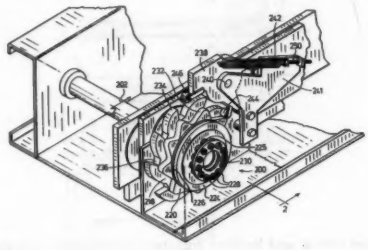
1. A staple remover and storage device to prevent scattering of staples comprising an elongated removed staple storage rail having an inclined upper face and tapering toward its leading end, said leading end terminating in a staple removing blade fixed on said storage rail and being in a common plane with a bottom surface of the storage rail, a cooperative handle having its rear end portion pivotally secured to a rear portion of said storage rail on a pivot axis extending transversely of the handle and storage rail, yielding means biasing said handle toward closely spaced parallel substantially coextensive relationship with the inclined upper face of the storage rail and allowing the handle to be swung away from the storage rail to facilitate emptying the storage rail of removed staples which have accumulated thereon, a yielding retainer element on a forward end portion of the handle disposed in a path of travel of removed staples entering onto the storage rail and preventing return movement of such staples beyond said retainer element toward the forward end of said rail, and a compressible strip of uniform thickness on a face of said handle which is normally opposed to said inclined upper face of the storage rail and exerting yielding stabilizing pressure on removed staples as they accumulate on and along the storage rail, swinging of said handle on said pivot axis away from the storage rail after the storage rail is filled with removed staples allowing such staples to be easily emptied from the storage rail.

4,513,952

DRIVE MECHANISM FOR CABLE DRUMS

Henry Vandelinde, Scarborough, Canada, assignor to Swing Stage Limited, Scarborough, Canada

Continuation-in-part of Ser. No. 288,588, Jul. 30, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 501,334
Claims priority, application European Pat. Off., Oct. 5, 1982, 82305294.9
Int. Cl.³ B66D 1/14, 5/04
U.S. Cl. 254—285 5 Claims



1. A drive mechanism for a plurality of hoist drums for rotating said drums in unison comprising, in combination,

a frame having a pair of spaced-apart, parallel support side walls, at least two axles journalled for rotation in said support walls of the frame, said axles journalled in a parallel, spaced-apart relation;

a drum adapted to receive a cable wound thereon mounted on at least one said axle concentric therewith;

three circular cam lobes of equal diameter rigidly mounted eccentrically on each of said axles between said support walls 120° angularly out of phase with each other, said cams having the same eccentricity relative to the axis of each axle;

three elongated link plates each having at least two circular holes formed therein adapted to receive and to interconnect the cam lobes on the axles inboard between the support walls in rotatable relationship whereby oscillatory motion imparted to the link plates by rotation of one of said axles rotates the other axle in unison;

means for driving one of said axles; and

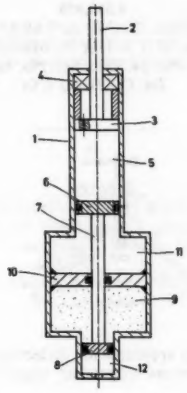
brake means for retarding the oscillatory motion of the link plates for slowing or stopping rotation of the drums, said brake means comprising a hub mounted on a said axle and rigidly secured to the cam lobes for rotation with the said cam lobes, cam means and detent means mounted on the hub for rotation thereon, and friction discs rigidly mounted on the hub for rotation therewith, said friction discs adapted to engage the cam means and detent means in frictional engagement for normal conjoint rotation together, and said cam means and detent means comprising a pair of control discs secured together for conjoint rotation, one of said discs having a plurality of equispaced cam lobes formed on its perimeter and the other of said discs having a plurality of corresponding dogteeth defining notches formed on its perimeter, a sensor-actuator having a cam follower and an engagement roller extending therefrom, said sensor-actuator being pivotally mounted and biased for rotation whereby said cam follower is urged against the disc cam lobes and tracks said lobes up to a predetermined rotary speed of the control discs and said cam follower leaves the surface of the cam lobes in excess of said predetermined rotary speed to cause the engagement roller to seat in a dogtooth to prevent further rotation of said discs and to cause the friction discs to stop rotation of the hub and the cam lobes secured thereto.

4,513,953

GAS SPRING WITH EXTENSION FORCE CONTROLLED AS A FUNCTION OF TEMPERATURE

Werner Molders, Plaidt; Rolf Langanke, Boppard; Egon Sentinger, Koblenz, and Hermann Reuschenbach, Rossbach, all of Fed. Rep. of Germany, assignors to Gas Spring Company, Division of Fichtel & Sachs Industries, Inc., Colmar, Pa.

Filed Apr. 14, 1983, Ser. No. 485,055
Int. Cl.³ F16F 9/52
U.S. Cl. 267—121 11 Claims



1. A gas spring comprising a vessel the interior of which contains a volume of gas under pressure and forms a working chamber entered by a piston rod guided within the vessel and sealed off against the outside, the extension force acting on the piston rod being equal to the product of the pressure in the working chamber and the cross-sectional area of the piston rod, wherein the improvement comprises:

a sliding parting piston defining an axially movable wall of the working chamber and sealed against the vessel; and

means for moving said parting piston as a function of change in ambient temperature so as to vary the volume of the working chamber in a manner to maintain the extension force within desired limits, said parting-piston moving means comprising a chamber containing an expansion medium and means operatively coupling said sliding parting piston to said expansion chamber.

4,513,954

DAMPING CORE ARTICULATED JOINT FOR MECHANICAL ARTICULATED ARM SYSTEMS SUBJECT TO VIBRATIONS

Lorenzo Cantamessa, Solto Collina, Italy, assignor to DAMP S.p.A., Sovere, Italy

Filed Dec. 3, 1982, Ser. No. 446,637
Claims priority, application Italy, Jul. 1, 1982, 2923 A/82
Int. Cl.³ F16F 15/08
U.S. Cl. 267—141.3 8 Claims

1. A damping core for an articulated joint between first and

second members, said core being adapted to be received in said first member and resisting relative rotational movement between the two members, said core comprising:

an elastomeric body which is elongated along an axis thereof, said body having a central opening for receiving said second member which opening is elongated along an axis thereof, the elongated axes of said body and opening being essentially coincident the width of said opening along said axis being greater at the ends of said elongated opening than at the middle of said elongated opening.

4,513,955

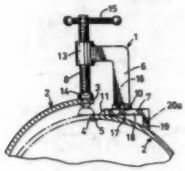
LEVEL CLAMP APPARATUS

Charles E. Daubon, 2271 S. 11th St., Milwaukee, Wis. 53215

Filed Jan. 24, 1983, Ser. No. 460,304

Int. Cl.³ B23Q *1/04*

U.S. Cl. 269—41 **7 Claims**



1. A level clamp apparatus for deflecting at least one of a pair of work members to product edge-to-edge alignment, comprising

an adaptor means having a support element adapted to be secured to one of said work members and having a plurality of working engaging members, said adaptor means having an outer mounting means secured to said support element,

a generally L-shaped member having intersecting first and second arms and a mounting means on the first arm complementing said adapter outer mounting means, and releasable attachment means for releasably interconnecting said mounting means to releasably affix said L-shaped member on said adaptor means for orienting of said L-shaped member and said support element with respect to said work members and

an adjustable forcing member secured to the outer end of said second arm of said L-shaped member and movable therethrough for engaging of the second of said work member.

4,513,956

CONVEYING DEVICE FOR SHEETS

Niels H. Sigvardt, Humlebaek, and Jan A. Baranski, Herlev, both of Denmark, assignors to Océ-Helioprint AS, Kvistgaard, Denmark

PCT No. PCT/DK82/00049, § 371 Date Jan. 18, 1983, § 102(e) Date Jan. 18, 1983

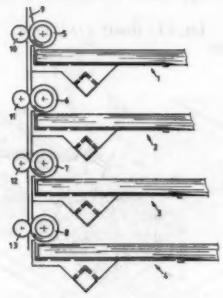
PCT Filed May 25, 1982, Ser. No. 460,245

Claims priority, application Netherlands, May 25, 1981, 8102551

Int. Cl.³ B65H *5/08*

U.S. Cl. 271—9 **14 Claims**

1. An apparatus for conveying sheets to a processing station, comprising: a plurality of sheet stack holders spaced apart along a conveyor path leading to said processing station; conveyor means for delivering a sheet from a stack on any selected one of said holders into said path and then along said path to said station, said conveyor means including a plurality of roller pairs mutually spaced apart along said path, each of said pairs comprising two relatively fixed rollers forming a nip to advance along said path a sheet gripped in the nip, with one roller of each pair disposed in part over a said stack holder and being selectively activatable to serve as a separation roller for feeding a sheet from the stack holder into said path; the portion of said path that leads from each stack holder situated nearer to said processing station coinciding with a portion of said path that leads from each stack holder situated farther from said processing station; means for bringing a sheet stack on any



selected one of said holders and the related separation roller in engagement and for activating that roller so as to feed a sheet from that stack into said path; and means operable when one of said separation rollers is activated to rotate all rollers of said pairs in unison.

4,513,957

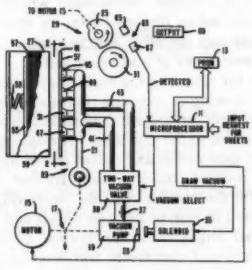
ITEM DISPENSING SYSTEM

William J. Schaefer, Jr., Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 3, 1983, Ser. No. 491,118

Int. Cl.³ B65H *3/08, 7/14, 7/16*

U.S. Cl. 271—90 **14 Claims**



1. A sheet dispensing system comprising:

a source of sheets;

a dispensing path;

pick-up means, including first and second means, movable between said sheet source and said dispensing path and being responsive to the application of a vacuum to one of said first and second means for feeding at least one sheet from said sheet source to said dispensing path;

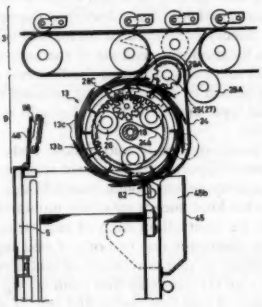
means for generating a signal in response to the failure of said pick-up means to feed a sheet to said dispensing path when a vacuum is applied to said one of said first and second means; and

means being responsive to the signal for applying a vacuum to the other one of said first and second means.

4,513,958
DEVICE FOR SWINGING ACCUMULATING WHEEL FOR USE IN AUTOMATIC MONEY DEPOSITING AND DISBURSING MACHINE

Eiichi Kokubo; Koichi Goi; Junichi Arikawa; Hideyuki Ebihara, and Hiroshi Chiba, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 463,054
Claims priority, application Japan, Feb. 4, 1982, 57-16597
Int. Cl.[3] B65H *29/00*
U.S. Cl. 271—187 1 Claim



1. In an automatic money depositing and disbursing machine including a plurality of boxes for containing bank notes and each having an upper opening through which bank notes are pulled out or stacked, and a plurality of accumulating wheels rotatably carried by an accumulating wheel oscillating shaft and positioned above respective boxes, each of said accumulating wheels having a plurality of paddles below which bank notes are inserted for delivery to respective boxes, and each of said accumulating wheels being swung to the lower accumulating position during the operation of accumulating and stacking bank notes into each of said boxes for passing the bank notes to the corresponding box and being swung to the upper retracted position during the operation of pulling out bank notes from said boxes, an improved device for swinging each of said accumulating wheels, which comprises a stopper integrally mounted on said accumulating wheel oscillating shaft and being biased by a spring to move said accumulating wheel normally and independently to said lower accumulating position, a swinging lug swingably mounted on said accumulating wheel oscillating shaft and adapted to be engaged with said stopper to swing the same in the direction so that said accumulating wheel is forcibly moved to the upper retracted position, and a link bar operatively connected to said swinging lug to swing the same between the angular positions for setting said accumulating wheel at the lower accumulating position and for setting said accumulating wheel at the upper retracted position.

4,513,959
SHEET DECELERATION APPARATUS

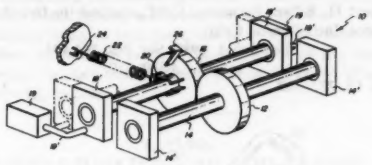
Robert J. Kindt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1982, Ser. No. 438,995
Int. Cl.[3] B65H *5/34*
U.S. Cl. 271—270 9 Claims

1. Apparatus for decelerating a sheet moving at a predetermined linear speed along a travel path, said apparatus comprising:

means, located in juxtaposition with the sheet travel path, for engaging a sheet traveling along such path, said means being actuated by engagement of a sheet to apply a deceleration force to such sheet during such engagement; and

means, operatively associated with said sheet engaging means and responsive to the engagement of a sheet by said sheet engaging means, for progressively increasing the deceleration force imparted to such sheet by said sheet

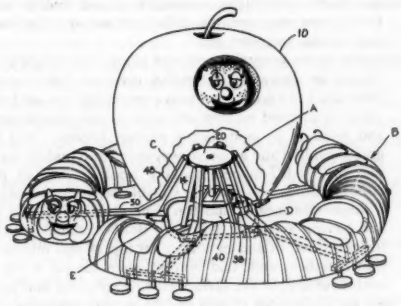


engaging means to gradually slow the linear speed of such sheet from the predetermined linear speed to a lesser linear speed.

4,513,960
UNDULATING AMUSEMENT RIDE APPARATUS

Gerald L. Barber, 10 Wittingtom Ct., Greenville, S.C. 29605, and Wayne P. Comstock, 23 Selwyn Dr., Greenville, S.C. 29615

Filed Oct. 17, 1983, Ser. No. 542,671
Int. Cl.[3] A63G *1/34*
U.S. Cl. 272—44 10 Claims



1. In an amusement ride device comprising:

base frame assembly means;

a driven vertical drive shaft rotatably carried by said base assembly;

hub means carried by the upper portion of said drive shaft;

ride supporting carrier arms pivoted to said hub means;

non-circular closed-loop track means carried by said base frame assembly means underneath said carrier arms having a track rail encircling said vertical axis;

a ride car unit carried by each said ride supporting carrier arm;

each said carrier arm including a pair of arm elements joined together at an apex portion;

a first of said arm elements having an upper end pivotally connected to said hub means;

a second of said arm elements having a free end extending away from said apex portion and on which end said car unit is carried above said second arm element;

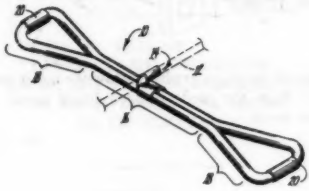
glide mechanism means pivotally carried by said carrier arm directly beneath said apex portion for pivotably interconnecting said carrier arm and said track means so that said carrier arm is supported thereby in a cantilevered manner;

whereby said carrier arms and passenger carrier means are vertically undulated on rotation of said vertical drive shaft.

4,513,961
TOGGLE BAR FOR EXERCISE AND HEALTH PURPOSES

Robert H. Killen, Pasadena, Calif., assignor to Gravity Guidance, Inc., Duarte, Calif.

Filed Jul. 1, 1982, Ser. No. 394,404
Int. Cl.³ A63B *1/02*
U.S. Cl. 272—62 **3 Claims**

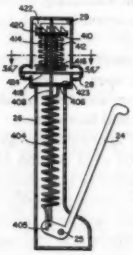


1. A toggle bar for exercise and health purposes comprising:
a continuous one-piece tubular member having a middle section and handle sections at opposite ends of said middle section;
said middle section comprising elongated, parallel and adjacent lengths of said tubular member;
said handle sections comprising outwardly extending lengths of said tubular member which first diverge from said ends of openings outwardly of said middle section having gripping portions at the extreme opposite ends of said tubular member; and
hanging means generally centered along said middle section having an upwardly extending inverted J-shaped hook connected to a securing means comprising top and bottom plates positioned on opposite sides of said middle section and retained by bolt means passing between said elongated, parallel and adjacent lengths of said middle section, said inverted J-shaped hanging hook having an inside concave arcuate surface for slidable pivoting reception of a suspension means, said top plate attached to said hook and having a bottom side with double concave surfaces for reception of and mounting on top of said middle section members and, said bottom plate having a top side with double concave surfaces for reception of and mounting on the bottom of said middle section members.

4,513,962
SPRING TYPE HAND GRIP EXERCISER

George E. Robson, 829 7th St., Hermosa Beach, Calif. 90254, and Paul R. Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677

Filed Jul. 10, 1983, Ser. No. 510,258
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—68 **3 Claims**

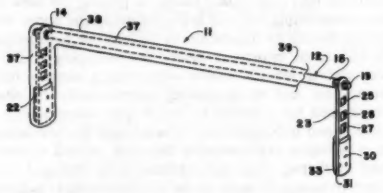


1. A spring type hand grip exerciser having a pair of members in which the initial force required to start bringing the two members together and the rate the force increases as the members are brought together is adjustable comprising:
a generally hollow body **26** having a first end and a second end, a base adjacent to said second end and being adapted to rest on a flat support surface such as a table;
a lever **24** extending into said body adjacent to said second end and attached to said body through a pivot pin **25** whereby said lever may be brought closer to said body by the exertion of force by a user, a first end of said lever extending outwardly from said hollow body and a second end of said lever engaging said pivot pin;
a first spring **404** one end of which is operatively connected to the second end **405** of said lever and the opposite end of which is fixedly connected to means **423** secured to said body at a location intermediate of the ends of said body;
a disc within said body, adjacent the first end of said body;
a rod **408**, one end of said rod being secured to the second end of said lever and the other end of said rod being fixed to said disc;
two compression springs in said hollow body, separate retainer means supporting each of said springs between said disc and a force selector plate in said body;
a force selector knob means rotatably mounted on said hollow body for controlling each of said retainer means to selectively disengage one or both of said separate spring retainer means so that movement of said lever is opposed selectively by (1) only said first main spring **404**, or (2) a combination of said first spring and one of said compression springs, or (3) a combination of said first spring and both of said compression springs.

4,513,963
WEIGHTED EXERCISING DEVICE

Bradley B. Nelson, 1105 6th Ave. NW, and Gregory T. Nelson, 2228 Central West, both of Great Falls, Mont. 59404

Filed Feb. 9, 1983, Ser. No. 464,786
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—128 **7 Claims**



1. Body exercise apparatus including a tubular member having a length significantly greater than the width of a person's shoulders, bearing means disposed within said tubular member adjacent the ends thereof, a bar member rotatably disposed within said tubular member along the axis thereof, the ends of said bar member extending through is exposed and beyond said bearing means, flat bar connector sections including a plurality of spaced openings extending along the length thereof engageable with the exposed end sections of said bar member, each of said openings being of a mateable and orientable configuration the same as that of the cross section of said exposed bar member end section and slightly larger, weight means for offering resistance to a user during an exercise, said weight means being permanently affixed adjacent the opposite end of each connector section, said weight means including pairs of weight sections affixed to opposite sides of said connector sections, said exposed bar member end section being mateably engageable with one of said connector section openings, means for orienting said connector sections with one another, fastener means releasably securing each connector section to an exposed bar member end section in the same orientation with one another and substantially perpendicular to said tubular member, and covering means disposed over at

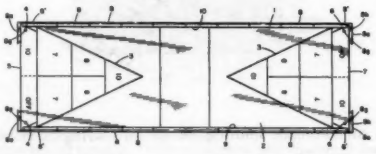
least said weight means for protecting the apparatus; whereby changing the openings that engage said bar member end sections changes the effective force exerted as said weight means are rotated about said tubular member.

4,513,964

PORTABLE SHUFFLEBOARD COURT

Arthur S. Gunderson, P.O. Box 215, 306 Illini Dr., Minooka, Ill. 60447

Continuation-in-part of Ser. No. 001,508, Jan. 8, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,805
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—126 R **5 Claims**



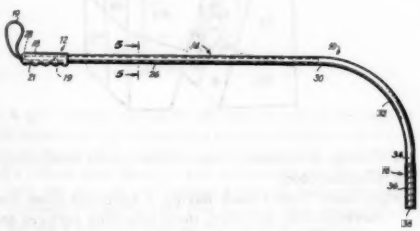
1. A portable shuffleboard court, comprising a length of flexible sheet material having a first end and a second opposite end, shuffleboard markings provided on said flexible sheet material, stiffening means to maintain said flexible sheet material flat for playing, anchor means to anchor said first and second ends for playing, said stiffening means including a plurality of substantially rigid elongated clips for detachably securing to side edges of said length of flexible sheet material, wherein a first one of said rigid elongated clips has a first end portion adjacent said first end of said length of flexible sheet material on a first side thereof, said first end portion including a laterally projecting planar portion, wherein said anchor means includes a first fastening member on said laterally projecting planar portion for cooperative fastening engagement with a corresponding second fastening member on said first end of said length of flexible sheet material.

4,513,965

BASEBALL BAT INSTRUCTION ACCESSORY UNIT

Kurt Aschermann, 1573 East Main Street, Mohegan Lake, N.Y. 10547

Filed Mar. 14, 1984, Ser. No. 589,619
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 R **1 Claim**



1. A baseball bat instruction accessory unit to teach the proper technique for hitting a baseball, which comprises:

(a) a gripping portion to allow the unit to be held by the batting instructor;

(b) a connecting portion defining a near end and a far end, said near end secured to the gripping portion, and a curved section so that the far end is not in axial alignment with the gripping portion; and

(c) an impact portion secured to the far end of the connecting portion, said impact portion having an impact designating means to present an appropriate target to the pupil,

said connecting portion being formed of hollow sheathing material and having a dowel positioned therein,

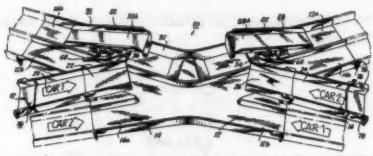
the dowel being in two parts, the parts spaced from each other, in order to prevent the full effect of the impact forces traveling from the distal part of the dowel into the gripping handle.

4,513,966

VEHICLE JUMP FOR A TOY VEHICLE GAME

Salvatore A. Mucaro, Maywood, N.J., and Neil Tilbor, Great Neck, N.Y., assignors to CBS Inc., New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 471,980
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—68 B **12 Claims**



1. A vehicle jump for a toy vehicle game having two toy vehicles, said vehicle jump comprising jump means including launching ramp means for launching an independently propelled toy vehicle into the air and landing ramp means for accepting a toy vehicle launched from said launching ramp means; repeatably actuable adjusting means for providing with each actuation thereof a step-by-step change in the inclination of said landing ramp means between an operative position, wherein a toy vehicle can negotiate said jump means, and an inoperative position, wherein said landing ramp means does not properly accept a toy vehicle launched from said launching ramp means; and a main base member defining two lanes thereon, one for each toy vehicle, wherein:

said landing ramp means includes a landing ramp pivotally mounted to said main base member for movement between said operative and inoperative positions;

said landing ramp in said operative position has an angle of inclination sufficiently low to accept a toy vehicle launched from said launching ramp and in said inoperative position has an angle of inclination steep enough to interfere with a toy vehicle launched from said launching ramp;

at least one of said lanes includes said jump means; and

said adjusting means includes actuating means for cooperating with a toy vehicle in the other said lane as the vehicle passes said landing ramp to change the inclination of said landing ramp one step with each passage thereby of the vehicle in the other said lane.

4,513,967

TOY VEHICLE GAME WITH LAUNCHER AND RETURN MEANS

Wayne R. Halford, and Walter S. Nakano, both of Manhattan Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1983, Ser. No. 566,591
Int. Cl.³ A63B *67/14*
U.S. Cl. 273—108 **5 Claims**

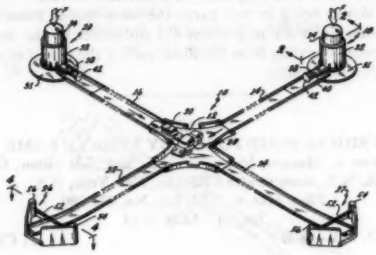
1. A toy car crash set comprising:

at least two nonsteerable unpowered toy cars;

an intersection having at least four ways;

at least two track sections having two ends, one end of each track section connected to the intersection and the other ends thereof leading to and attached to at least two launchers; and

at least two elastic return means connected to the outer ends of further track sections having their inner ends connected



to the intersection, diagonally opposite from each of the launchers.

4,513,968

DEVICE FOR HOLDING DISPLAY PLATE FOR GAME MACHINE

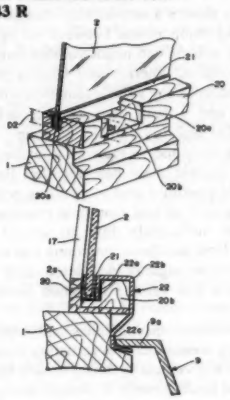
Tomoo Okada, Tochigi, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Sep. 20, 1983, Ser. No. 533,957

Claims priority, application Japan, Sep. 27, 1982, 57-144842[U]

Int. Cl.³ A63F 5/04

U.S. Cl. 273—143 R 6 Claims



1. In a game machine, in which a display plate with display characters or the like thereon is fitted in a groove of a plate retainer secured to the front of a machine body and a front door is hinged to the machine body at a position beneath the display plate, a device for removably holding the display plate comprising:

a lower plate retainer secured to said machine body and having a groove for receiving the lower edge of said display plate and a notch perpendicular to said groove and having a greater depth than the depth of said groove; and

a cover plate disposed to cover the front of said lower plate retainer, said cover plate having a top bent lower portion inserted in said groove of said lower plate retainer adjacent to the lower edge of said display plate and also having a lower portion held urged by a top portion of said front door.

4,513,969

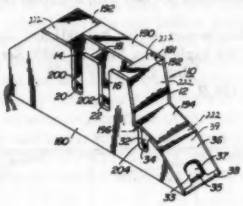
AUTOMATIC CARD SHUFFLER

J. Edward Samsel, Jr., Southampton, Pa., assignor to American Gaming Industries, Inc., Philadelphia, Pa.

Filed Sep. 20, 1982, Ser. No. 420,514

Int. Cl.³ A63F 1/12

U.S. Cl. 273—149 R 23 Claims



1. An automatic shuffling device for playing cards comprising

a housing defining at least two wells for receiving two stacks of playing cards,

a first electrically operated means to extract cards from said wells, and

an electrical controller to randomly actuate said first electrically operated means so as to randomly select cards from the wells and thereby randomly intermix the cards as they are extracted from said wells.

4,513,970

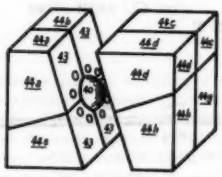
POLYMORPHIC TWIST PUZZLE

Ovidiu Opresco, 3177 33 St., Long Island City, N.Y. 11106, and Jon D. Marinesco, 90-02 63 Ave., Rego Park, N.Y. 11374

Filed Jan. 24, 1983, Ser. No. 465,562

Int. Cl.³ A63F 9/08

U.S. Cl. 273—153 S 1 Claim



1. A three dimensional combination puzzle comprising

a spherical core,

eight outer bodies each having a spherical inner surface movable over said core, three adjoining surfaces and an outer surface,

said adjoining surfaces mutually perpendicular to each other and defining planes of rotation intersecting at the center of said spherical core,

means associated with said adjoining surfaces releasably maintaining said outer bodies assembled about said core, and enabling said outer bodies to be rotated in sets of four about said core,

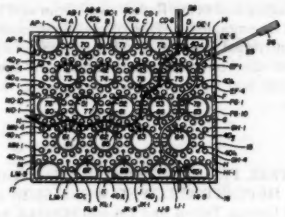
said outer surfaces forming a cube when said outer bodies are in proper combination and a plurality of said adjoining surfaces are not parallel to the faces of said cube.

4,513,971

MAZE AND FLEXIBLE WAND GAME APPARATUS

David L. Baldwin, 731 NE. 51st Court, Pompano Beach, Fla. 33064

Filed May 2, 1984, Ser. No. 606,154
Int. Cl.[3] A63F 9/06
U.S. Cl. 273—153 R 18 Claims



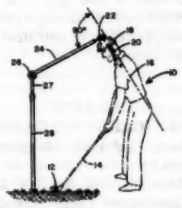
1. A game apparatus comprising:
a game board having a hollow interior and openings leading into its hollow interior, means providing abutments inside said game board defining a maze of passageways which communicate with said openings;
and an elongated flexible and resilient wand which is insertable through a selected one of said openings into said hollow interior of the game board to emerge at another of said openings, depending upon how a player manipulates the wand;
said wand having a leading end which is tapered on one side to determine the direction in which the wand is deflected by abutments it engages in said maze of passageways.

4,513,972

GOLFER'S HEAD MOVEMENT RESTRAINING DEVICE

John E. Empie, 5428 Halifax La., Minneapolis, Minn. 55424

Filed May 2, 1983, Ser. No. 490,431
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—190 R 6 Claims



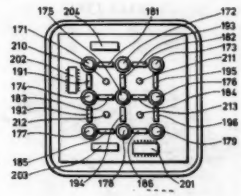
1. A golf training device for affixing an axis of the body of a golfer relative to a preferred axis for constraining body motion to aid in the development of a consistent swing, comprising
(a) a tubular pole having a first section adapted for insertion into the ground and having a second telescopic section extensibly fitted to said first section, said second section having a free end adapted for vertical projection
(b) an adjustable toothed clutch attached to said second section free end, said clutch having a selectively rotatable member forming a part thereof;
(c) a shaft having an end attached to said selectively rotatable member and having a second free end;
(d) a rotatable coupling attached to said shaft second free end, said coupling permitting only rotational movement about a preferred axis normal to said shaft and parallel to the axis of the body of a golfer to be affixed relative to the preferred axis; and
(e) a head cap attached to said rotatable coupling, said head cap having downwardly depending sides for tightly enclosing at least a portion of the head of a golfer and being adapted for tightly fitting over the head of a golfer, and said head cap having an adjustable chin strap adapted for securing about said head; whereby the head of a golfer is constrained to permit motion only about said preferred axis.

4,513,973

ELECTRONIC COMPLETING THE SQUARE GAME

Iain Sinclair, Willow House/Hildersham, Cambridge, England

Filed Oct. 25, 1983, Ser. No. 545,675
Claims priority, application United Kingdom, Oct. 27, 1982, 8230613
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—237 12 Claims



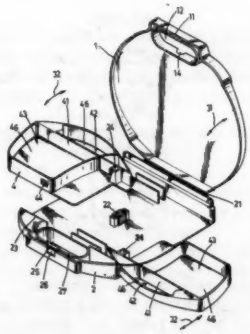
1. Electronic game apparatus comprising:
a playing surface;
a plurality of manually operable switch means arranged in a matrix of rows and columns on said playing surface,
a plurality of illuminable indicator means spaced over said playing surface with one between each pair of adjacent said switch means in said rows and columns thereof, and
electronic circuit means operable in response to the actuation of any two adjacent said switch means to cause illumination of said illuminable indicator means located between said two adjacent switch means.

4,513,974

CHESS BOX

Hong-Pei Lin, Fl. 2, No. 381, Sec. 5 Nan-Ching East Rd., Taipei, Taiwan

Filed Feb. 16, 1984, Ser. No. 580,728
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—239 6 Claims



1. A novel chess box comprising:
a main body portion having a magnet at its center;
a lid hinged on said main body portion;
a pair of containers each of which is pivoted on said main body portion and provided with a sheet iron which is

designed so that said sheet iron will be in contact with said magnet of said main body portion when said container is turned into said main body portion;

a positioning plate removably mounted on said main body portion;

a number of boards of various kinds of board games placed on said positioning plate and capable of being mounted on the top of said lid; and

a plurality of playing pieces for playing with said board games.

4,513,975

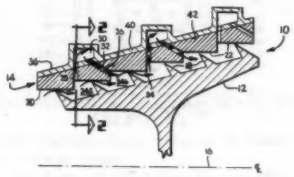
THERMALLY RESPONSIVE LABYRINTH SEAL

Ambrose A. Hauser, Wyoming; Rolf R. Hetico, Cincinnati, both of Ohio, and Thomas G. Wakeman, Greendale, Ind., assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 27, 1984, Ser. No. 604,561

Int. Cl.³ F16J *15/44*

U.S. Cl. 277—22 **6 Claims**



1. In a rotary seal including a first member with at least one ring shaped seal tooth and a second member with an abradable shroud and casing, wherein said members cooperate to inhibit flow of fluid from a first region to a second region, the improvement comprising:

a conduit for conducting a portion of said fluid through said casing from said first to said second region for heat transfer between said fluid and said casing.

4,513,976

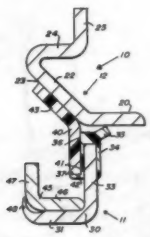
ROTATING-LIP GREASE SEAL

Gustavus A. Bentley, Ann Arbor; Stephen E. Nash, Farmington Hills, and Gerald P. Pichler, Dearborn, all of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Jun. 6, 1984, Ser. No. 617,699

Int. Cl.³ F16J *15/32, 15/34*

U.S. Cl. 277—25 **6 Claims**



1. A fluid seal, including in combination:

a stationary rigid member having a radially inner peripheral cylindrical portion joined to a peripheral frustoconical portion having a lip-engaging radial inner surface,

a sealing assembly having a supporting case provided with a radially outwardly extending flange lying radially within said rigid member,

an elastomeric body bonded to said flange and having, to one side of said flange, a radially outwardly projecting frustoconical auxiliary lip engaging said peripheral cylindrical portion, and

a main sealing lip comprising an annular, flexible, polytetrafluoroethylene planar wafer bonded to said body on the other side of said flange from said auxiliary lip and extending radially outwardly, said wafer normally tending to lie in a substantially radial plane, said wafer having an outer edge and first and second opposite faces, one said face engaging and being flexed away from said auxiliary lip by said lip-engaging surface of said frustoconical portion,

the centrifugal force of rotation of said rotating member in either direction tending to urge both lips more snugly against said rigid member lip-engaging radial inner surface.

4,513,977

STEEL FLOATING SEAL WITH REMELTED DEPOSIT-ALLOYED WEAR SURFACES

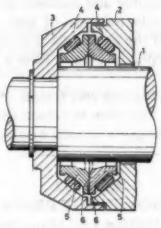
Genkichi Umeha, Tokyo, and Takeshi Hiraoka, Saitama, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,151

Claims priority, application Japan, Sep. 7, 1982, 57-134910[U]

Int. Cl.³ C23F *7/04;* **C21D** *1/78;* **F16J** *15/34, 15/28*

U.S. Cl. 277—96.2 **4 Claims**



1. A floating seal comprising; a seal member having a seal face and a body, said body being formed of steel, said seal member being provided at said seal face with a surface remelted, deposit-alloyed surface having a thickness on the order of several millimeters, portions of said steel body adjacent said seal face being martensited.

4,513,978

CYLINDER HEAD GASKET

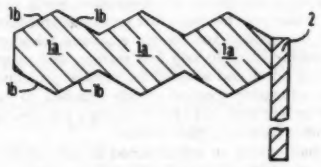
Terence P. Nicholson, Calf Hall, Muggleswick, Derwentside, Co. Durham, England

Filed Dec. 18, 1981, Ser. No. 332,211

Claims priority, application United Kingdom, Dec. 19, 1980, 8040880

Int. Cl.³ F16J *15/48, 15/32;* **F16K** *41/00*

U.S. Cl. 277—235 B **2 Claims**



1. The combination of a gasket and cylinder head and cylinder block assembly including a cylinder liner having an end recess, said gasket comprising a substantially planar ring being in radial cross section of varying thickness corrugation, and having an annular skirt integrally depending from the outer

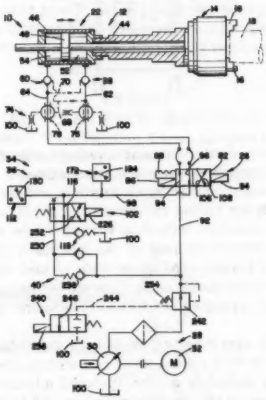
peripheral edge for locating said ring with respect to the bore of the liner said recess accommodating the corrugated radial cross section part of the gasket and a radially outward open recess which accommodates the gasket skirt.

4,513,979

MACHINE TOOL WITH CHUCKING CONTROLS

Martin L. Silverman, South Euclid, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 24, 1983, Ser. No. 478,566
Int. Cl.³ B23B *31/30*; F15B *13/042*
U.S. Cl. 279—4 **6 Claims**



1. A machine tool comprising chuck means for gripping a workpiece with a first force during a first machining operation and for gripping the workpiece with a second force which is less than the first force during a second machining operation, motor means having first and second motor chambers for holding fluid to effect operation of said chuck means to grip the workpiece with a force which varies as a function of a fluid pressure differential between said first and second motor chambers, said first motor chamber holding fluid at a first pressure during the first machining operation and holding fluid at a second pressure which is less than the first pressure during the second machining operation, said second motor chamber holding fluid at a minimum pressure which is less than the first and second pressures during the first and second machining operations, and chucking force control means for reducing the force with which said chuck means grips the workpiece from the first force to a transition force which is less than the second force while the first fluid pressure is present in said first motor chamber and for increasing the force with which said chuck means grips the workpiece from the transition force to the second force, said chucking force control means including pressure control means for increasing the fluid pressure in said second motor chamber from the minimum fluid pressure to a transition fluid pressure which is greater than the second fluid pressure and less than the first fluid pressure while the first fluid pressure is present in said first motor chamber and for simultaneously reducing the fluid pressures in said first and second motor chambers until the fluid pressure in said first motor chamber is equal to the second fluid pressure.

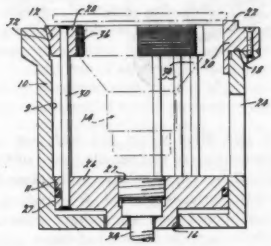
4,513,980

CHUCK COLLET

William C. Kruse, 1925 Vinsetta Blvd., Royal Oak, Mich. 48073

Filed Jan. 19, 1981, Ser. No. 226,490
Int. Cl.³ B23B *31/12*
U.S. Cl. 279—51 **1 Claim**

1. A chuck for a stationary machine tool for engaging a workpiece for rotation comprising; (a) an elongated support means adapted to be mounted for rotation on a machine, (b) an elongated chuck collet supported by said support means for solely axial motion with respect thereto, said support means having axially spaced first and second surfaces, said collet having axially spaced first and second surfaces, said first collet surface and said first support means surface being correspondingly tapered and engaging one another, for deflecting said first surface of said collet radially to grip said workpiece upon relative axial motion between said collet and said support means in one direction and to release said workpiece upon relative axial motion between said collet and said support means in the opposite direction, said second collet surface and said second support means surface being generally cylindrical and engaging one another for guiding axial movement of said chuck collet relative to said support means, said first collet



surface being defined by three or more annular jaw segments and said second collet surface being defined by an annular base, said jaw segments being connected to said base by at least three separate and elongated spring steel rods constructed so that they are stiff enough to support said jaw segments away from said workpiece and flexible enough to accommodate and grip workpieces having rough surfaces and/or having differing cross-sectional shapes, said flexible members being formed of a material chosen for its flexibility and said jaw segments being formed from a different material chosen for its hardness, said rods being disposed in holes in said base member with all of the rods connected to a single jaw segment intersecting said base member and said jaw segment along an arcuate path, and (c) means on said support means for transmitting rotary driving forces from said support means to said chuck collet without significantly tortionally stressing said flexible members.

4,513,981

RIDE-ON TOY VEHICLE WITH FRONT WHEEL DRIVE AND OUTBOARD FRONT WHEELS

Robert DeGraaff, 20 Kennedy Dr., Flanders, N.J. 07836, and Michael Langeiri, 425 Inverness La., Longmeadow, Mass. 01106

Filed May 4, 1983, Ser. No. 491,422
Int. Cl.³ B62K *9/00*
U.S. Cl. 280—1.11 R **8 Claims**

1. A child's pedal-powered vehicle comprising:

A. a body providing a sidewall portion, a seat portion enclosed thereby and a top wall portion;

B. a drive and steering assembly having a rotatable steering column extending upwardly through the front portion of said body and centrally thereof, said assembly including steering handle means adjacent the upper end of said steering member for effecting rotation thereof, said steering assembly having drive wheel means rotatably mounted adjacent the lower end of said column and pedal means for effecting rotation of said drive wheel;

C. means securing said drive and steering assembly on said body for rotation relative thereto;

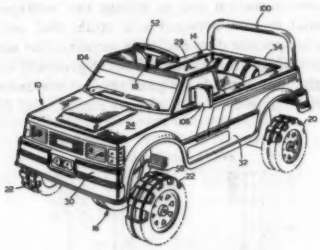
D. a rear wheel assembly comprising axle means and a pair

of rear wheels rotatably supported by said axle means adjacent said sidewall of said body;

E. means securing said rear wheel assembly on said body;

F. a pair of outboard front wheels disposed outwardly of said drive wheel and adjacent said sidewall of said body;

G. means mounting said front wheels on said body for normal disposition in the plane defined by the lowermost



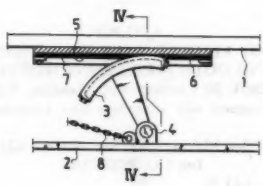
surfaces of said drive wheel and said rear wheels for rotation upon motion of said vehicle over a surface and for limited vertical movement relative to the plane defined by the lowermost surfaces of said drive wheel and rear wheels, whereby said front wheels have limited frictional contact with the support surface and move upwardly and downwardly independently of said drive wheel.

4,513,982

SLEDGE OR EQUIVALENT TRANSPORTING BASE

Pekka Niemelä , Säpikäsmutka 2 A, 96440 Rovaniemi 44, Finland

Filed Nov. 30, 1982, Ser. No. 445,736
Claims priority, application Finland, Dec. 15, 1981, 814017
Int. Cl.³ B62B *13/00*
U.S. Cl. 280—26 **3 Claims**



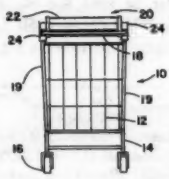
1. Sledge or equivalent transporting base consisting of a frame, at least one runner mounted under the frame, with reference to which the frame is movable longitudinally, an arc-shaped rolling member pivotally attached to the runner which has the center point of its radius located at the pivotal point and which is free to roll along an opposed counterface on the frame, and retaining ropes placed side by side provided between the rolling member and the counterface, the ends of one of said ropes being affixed at the front end of the rolling member and at the rear end of the counterface and the ends of the other rope being affixed at the rear end of the rolling member and at the front end of the counterface.

4,513,983

POINT-OF-PURCHASE ADVERTISING FOR SHOPPING CARTS

Robert E. Calder, 9292 Cincinnati-Dayton Rd., Cincinnati, Ohio 45241

Filed Jan. 28, 1983, Ser. No. 462,096
Int. Cl.³ G09F *11/02*
U.S. Cl. 280—33.99 A **15 Claims**



4. A shopping cart comprising a merchandise receptacle,

frame structure supporting said receptacle,

wheels mounted on said frame structure and supporting said receptacle for rolling movement,

said frame structure including vertical frame members extending toward the rear of the receptacle and a handle extending between the upper ends of said vertical frame members, said handle being disposed behind and generally toward the upper end of said receptacle and spaced therefrom,

whereby the cart may be pushed by a user when shopping,

characterized by a rotary, point-of-purchase display,

said display including a tube, disposed adjacent the upper rear portion of the receptacle, and spaced from the handle a distance sufficient for the handle to be readily gripped by a shopper when using the cart,

said display tube being of polygonal cross section, thereby providing planar display portions, said display tube further being transparent, whereby advertisements positioned on the inner surfaces of the tube may be viewed by a shopper and protected from abuse,

means for journaling said display tube on said frame structure with its axis generally parallel to said handle,

means for positioning replaceable strips of printed advertising material against the inner surfaces of the planar display portions, whereby the display tube may be rotated to bring successive advertisements on the tube to the attention of shoppers as the cart is in use, and

further characterized by

end caps embracing the ends of the display tube and,

the journal means including

a pair of brackets respectively secured to the upper ends of the vertical frame members and having aligned bores, and

inwardly projecting trunnions secured in the bores of said brackets, said end caps having central bores in which the trunnions are journaled.

4,513,984

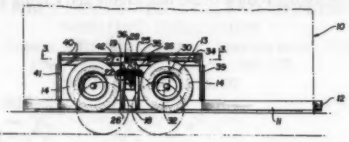
WHEEL GEAR FOR TRAILERS

Clem B. Wright, South Fulton, Tenn., assignor to Waymatic, Inc., Fulton, Ky.

Filed Apr. 12, 1983, Ser. No. 484,292
Int. Cl.³ B62D *61/10*
U.S. Cl. 280—43.23 **5 Claims**

1. A wheel suspension for special event trailers and the like comprising a frame adapted for connection rigidly with the framework of a trailer body portion, tandem wheel crank arms on said frame adapted to swing vertically, vertical trackway means on said frame between said crank arms, guided vertical carriage means engaged with the vertical trackway means and having follower means, spring means interconnecting said carriage means and crank arms, elevated substantially horizon-

tal trackway means on said frame, horizontally movable cam lifting means engaged guidingly with the horizontal trackway means and having an inclined edge portion and vertically



spaced horizontal edge portions all engageable with said follower means, and power means connected between said frame and the cam lifting means to move the cam lifting means in opposite directions along said horizontal trackway means.

4,513,985

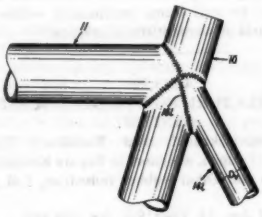
BICYCLE FRAME SEAT STAYS

David R. Graham, West Redding, Conn., assignor to Cannondale Corporation, Georgetown, Conn.

Filed Jan. 6, 1983, Ser. No. 456,302

Int. Cl.³ B62K *19/02*

U.S. Cl. 280—281 R **4 Claims**



1. Seat stays of a bicycle frame, namely tubular members joining the upper portion of the seat tube to the respective rear wheel dropouts, characterized in that at each cross section along the length of each seat stay the area moment of inertia I_v about the vertical axis is substantially greater than the area moment of inertia I_h about the horizontal axis.

4,513,986

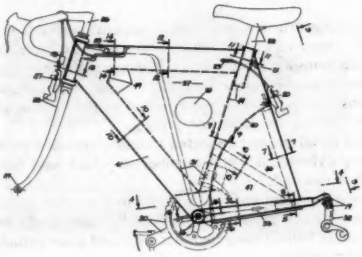
BICYCLE FRAME

James L. Trimble, 8628 Emerald Rd., Anchorage, Ak. 99502

Filed Jun. 28, 1983, Ser. No. 508,880

Int. Cl.³ B62K *3/02, 19/02*

U.S. Cl. 280—281 R **5 Claims**



1. A bicycle frame comprising, in combination, a tubular steering support column formed to rotatably support a handle bar stem and front fork and wheel assembly; a tubular seat support column formed to support a seat post and seat assembly; a tubular pedal axle support column formed to rotatably support a pedal crank and chainwheel assembly; cantilever rear fork blades formed to support a rear wheel assembly, the frame having the form of (1) an exterior structural skin surface, connected to and extending between said columns and rear fork blades in such a manner that the perimeter edges of said skin define the outline of the frame's geometry from the side view and an airfoil section with a blunt edge at the steering support column, and a sharp edge at the seat support column, and lower rear sides adjacent to the portion of the rear wheel assembly which penetrates the frame's geometry arranged in spaced apart substantially, parallel configuration positioned as closely as possible to the rear wheel assembly, from the plan view, (2) an internal arcuate fender, formed of structural skin, which encloses the portion of the rear wheel assembly which penetrates the frame's geometry, and fits within lower rear sides of said exterior structural skin, and internal reinforcing means which, in combination with said structural skin, form structural members including, (3) tubular members connecting the steering support column and seat support column, and the steering support column and pedal axle support column formed by the addition of an elongate web member secured in a substantially perpendicular manner between opposing interior surfaces, and parallel to the perimeter edge of said structural skin, (4) spaced apart, diverging, tubular members connecting the pedal axle column and cantilever rear fork blades, so arranged as to allow external routing of rear wheel drive chain and external placement of rear wheel drive sprocket(s) and shifting mechanism, formed by an integral outward extension of the lower edge of said exterior structural skin forming top, outside, and bottom surfaces secured to a separately formed inner surface by flanges at the top and bottom, completing a substantially rectangular tube section provided with the pedal axle column and rear fork blade support means at respective ends; (5) elongate reinforcing strips connecting rear, inner ends of said tubular rear fork support members with said seat support column, and at an intermediate position roughly bisecting said rear fender, with a seat support web and connecting member, said reinforcing strips filling a void space between said exterior structural skin and said internal structural skin of fender, (6) an elongate web member connecting seat support column and pedal axle support column secured in a substantially perpendicular manner between opposing inner surfaces of said structural skin, and (7) a web member secured in a substantially perpendicular manner between opposing inner surfaces of said structural skin, placed above and parallel to a line connecting the pedal axle column and rear wheel axle, and connected to the pedal axle support column by a vertical connecting member.

4,513,987

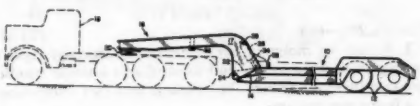
SELF-CONTAINED LIFTING APPARATUS FOR LOW-BOY TRAILERS

Gene C. Whitaker, Wilbur, Oreg., assignor to Whitlog, Inc., Wilbur, Oreg.

Filed Sep. 30, 1982, Ser. No. 429,098

Int. Cl.³ B60P *1/34;* **B62D** *53/06*

U.S. Cl. 280—423 B **4 Claims**



1. A lifting apparatus for a trailer of the type which is connected to a towing vehicle by means of a gooseneck which is operably independent of the trailer and the towing vehicle, said apparatus comprising:

(a) said gooseneck and said trailer being rotatably coupled to one another at a common pivot point;

(b) extensible means extending between a first point located

on said trailer and a second point located on said gooseneck, wherein said extensible means is rotatably connected at one extremity thereof to said gooseneck and slidably contacts the trailer at the other extremity thereof;

(c) said first point, second point and pivot point being arranged relative to one another such that as said extensible means is extended and retracted said gooseneck and said trailer rotate about said pivot point in directions which are opposite to one another;

(d) said gooseneck being arranged such that said extensible means is substantially enclosed therein during the full range of travel of said extensible means; and

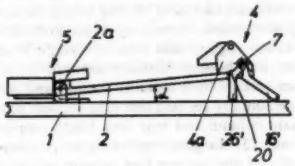
(e) first stop means associated with said gooseneck for limiting the extent of the transverse movement of said other extremity of said extensible means in a direction toward the towing vehicle.

4,513,988

DEVICE FOR CROSS-COUNTRY SKIING

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Sep. 1, 1982, Ser. No. 413,914
Claims priority, application Austria, Sep. 11, 1981, 3946/81
Int. Cl.³ A63C 9/081
U.S. Cl. 280—615 **19 Claims**



1. A cross-country skiing device for a safety ski binding, comprising a cross-country plate with a front jaw and a heel holder, said cross-country plate being pivotal about an axis which extends transversely with respect to the longitudinal axis of the ski and movably supporting a bar which can be swung into a position below said cross-country plate for cross-country skiing, in which position said bar is held against further movement by stops provided on both sides of said cross-country plate, wherein said bar can be swung into a retracted position for downhill skiing, and wherein said bar, in relationship to the plane of said cross-country plate, can be adjusted to have different heights and includes two bar parts which each have two spaced legs, one said bar part being supported for pivotal movement relative to the other said bar part, and including reinforcing means disposed between and cooperable with said legs of each said bar part for rigidifying each said bar part.

4,513,989

GOLF CART

Norman Czajkowski, 8815 Walnut Hill Rd., Chevy Chase, Md. 20015

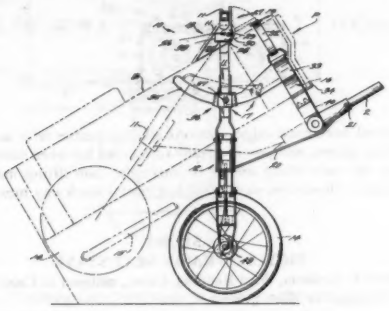
Filed Apr. 2, 1979, Ser. No. 26,166
Int. Cl.³ B62B 1/12
U.S. Cl. 280—645 **27 Claims**

2. A cart for mounting an elongated structurally rigid bag having an opening at one end thereof, and a single handle at one side thereof adjacent the opening, said cart comprising

a frame mechanism;

means for attaching a pair of wheels, rotatable about a common axis, to said frame mechanism; and

means for mounting said frame mechanism to a bag by its single handle so that the bag handle is on the opposite side of the bag as said wheels; and for providing pivotal movement of said frame mechanism with respect to the bag mounted thereby about an axis parallel to said wheels common axis and extending through the bag handle, said mounting means consisting of structures engaging said bag disposed only between the bag handle and the opening, and said mounting means comprising an insert having substantially the same exterior configuration as the interior configuration of the bag handle and having a pivot pin



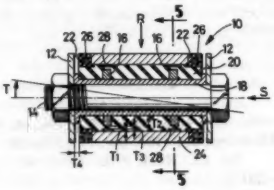
extending outwardly from the sides thereof, and releasable clamping means mounted to said frame mechanism for engaging said pivot pin to fix the position of said insert with respect to said frame mechanism while allowing relative pivotal movement therebetween.

4,513,990

BUSHING STRUCTURE IN A VEHICLE SUSPENSION SYSTEM

Yasuhiro Morita, Okazaki, and Yoshikazu Tsukamoto, Inuyama, both of Japan, assignors to Toyota Kidosha Kabushi Kaisha, Toyota and Tokai Rubber Industries, Ltd., Komaki, both of, Japan

Filed Jan. 24, 1983, Ser. No. 460,540
Claims priority, application Japan, Jan. 30, 1982, 57-12389[U]
Int. Cl.³ B60G 11/14
U.S. Cl. 280—725 **8 Claims**



1. A bushing structure in a vehicle suspension system including support means secured to vehicle members such as a chassis and an axle housing, a fulcrum shaft supported by the support means and rotatably supporting the bushing structure, and a suspension member pivotally connected to the bushing structure, said bushing structure comprising:

an outer metal fitting connected to said suspension member;

an inner cylindrical metal member in which said fulcrum shaft is inserted;

an annular resilient member secured to the outer periphery of said inner cylindrical metal member and press-fitted in said outer metal fitting together with said inner cylindrical metal member;

a plurality of radial stop rings positioned within said annular resilient member in spaced relation with one another axially of said annular resilient member; and

at least one annular elastic axial stop member including a stop ring embedded therein, said axial stop member being fitted on one of the axial end portions of the outer periph-

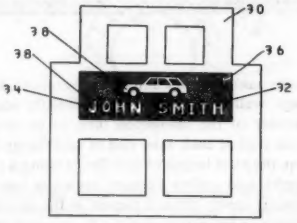
ery of said annular resilient member and engaging a corresponding end face of said outer metal fitting.

4,513,991

CONVERTIBLE DESIGN SURFACE, AND METHOD FOR FORMING THE DESIGN

Bruce J. Renaud, 1443 Seminole Ave., Detroit, Mich. 48214

Filed Jul. 16, 1982, Ser. No. 399,137
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—1 R **19 Claims**



1. In an article upon which a wide variety of designs may be made:

a surface comprising a grid-like field of closely arranged discrete projections;

each projection having a plurality of layers each of a different color; and

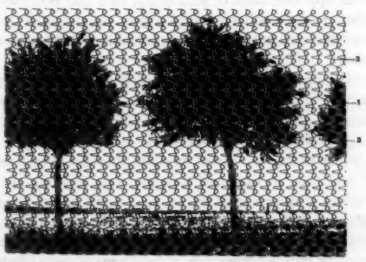
said projections being selectively removable at any desired locations within the field to create a pattern of different color cross-sections collectively exhibiting the desired design.

4,513,992

DATA CARRIER HAVING A PICTURE THEME SUPERIMPOSED BY A LINE PATTERN AND A METHOD OF PRODUCING SAME

Stefan May, Herbertshausen, and Hans Müller, Munich, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation and Organisation mbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 307,981, Oct. 2, 1981, Pat. No. 4,459,020. This application Apr. 12, 1984, Ser. No. 599,429
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038179
Int. Cl.³ B42D *15/00*; **G03B** *27/02*
U.S. Cl. 283—94 **12 Claims**



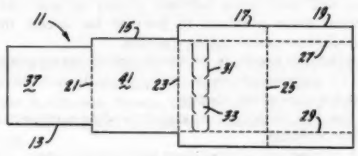
1. In a data carrier such as check paper or the like having a picture theme printed thereon and also having a security pattern printed thereon, the improvement comprising a picture theme overlapped by a negative security pattern which is formed by interruptions of the printed picture theme and which is geometrically similar or identical to the form of the printed security pattern, and the printed security pattern is printed congruently into the contour of said negative security pattern.

4,513,993

TEAR OPEN TAMPER RESISTANT GAME TICKET ASSEMBLY

Lyman J. Brown, Oak Brook, Ill., assignor to Bates Printing Specialties, Inc., Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,312
Int. Cl.³ B42D *15/00*; **B41L** *1/20*
U.S. Cl. 283—103 **3 Claims**



1. A tear open tamper resistant game ticket assembly including:

a rear panel, a front panel, an intermediate panel and a ticket panel,

the panels being cut from a single piece of paper and attached to one another by fold lines so that the panels can be folded over one another into a multi-layered assembly with the ticket panel located between the front panel and the intermediate panel and the intermediate panel located between the front panel and the rear panel,

the intermediate and ticket panels being narrower than the front and rear panels,

the rear panel being adhered to the intermediate panel and to portions of the front panel on opposite sides of the intermediate panel when the panels are folded into their multi-layered assembly,

perforated lines formed in the front and rear panels near the side edges thereof with the perforated lines located approximately in alignment with the side edges of the intermediate panel, and

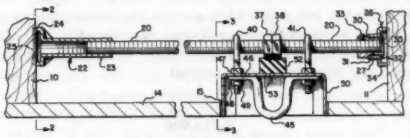
a tear tab formed by slit lines in the front panel and extending between the perforated lines on the opposite sides thereof.

4,513,994

CEILING FAN AND OUTLET BOX SUPPORT

Donald L. Dover, and William J. Leitch, both of Memphis, Tenn., assignors to Robbins & Myers, Inc., Dayton, Ohio

Filed Jan. 31, 1983, Ser. No. 462,246
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—544 **1 Claim**



1. A hanger and junction box assembly for supporting a ceiling fan or the like between a pair of ceiling joints, comprising:

an elongated threaded rod having a length less than the transverse space between said joists,

a first support piece having a tubular end thereof threaded on an end of said rod for extension and retraction move-

ment in response to relative rotation between said piece and said rod,

means on the end of said support piece defining an enlarged joist-gripping end remote from said rod,

a second support piece having a tubular body and an enlarged joist-gripping end,

an adapter mounting said second support piece on the opposite end of said rod for relative rotation into said second piece while maintaining a relatively fixed axial location with respect to said rod,

a pair of engagement nuts on said rod for applying a wrench or the like thereto for causing rotation of said rod when in an engageable position to bring said pieces into physical engagement with the adjacent surfaces of a spaced ceiling joist, said nuts being movable axially of said rod into selected drive positions to provide for access thereto through a prepared ceiling opening,

a pair of hanger eye bolts, one each slidably received on said rod on opposite sides of said nut and each having a threaded depending portion,

a junction box supported on said depending portions at said ceiling openings,

a block of elastomer compressed between the upper surface of said box and said nut to take up slack between said eye bolts and said rod, and

a generally U-shaped ceiling for hanging bracket carried on said depending portions in said box for supporting a ceiling fan thereon.

4,513,995

METHOD FOR ELECTROLYTICALLY TIN PLATING ARTICLES

Norbert Niehaus, Düsseldorf; Werner Friehe, Mülheim, and Wilhelm Schwenk, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,426

Int. Cl.³ C25D *7/04, 5/50*

U.S. Cl. 285—55 **6 Claims**

1. Method for electrolytically metal-plating tube sections made of chromium, chromium-molybdenum, or chromium-nickel-molybdenum alloy stainless steel, by cleaning and degreasing such a section, by pickling the section in a diluted acid or an acid blend, by electrolytically metal-plating the section, by briefly melting and by cooling of the metal coating characterized in that the tube section has been provided with thread and after pickling at least the threaded portion of the section is first subjected to a currentless nickel coating step to provide a nickel layer of a thickness of about 1 micrometer and then subjected to a step of electrolytic metal plating, and that after the electrolytic metal plating of the threaded portion of the section, the section is at first stored at a temperature between about 150 degrees to about 200 degrees Centigrade for about 120 to 30 minutes and is heated from that temperature for a few seconds for melting the metal coating and is immediately thereafter quenched.

6. A string of tubing made of threaded tubes for the oil and gas industry, using threaded sleeves for interconnecting pin members, wherein all sleeve threads are treated in accordance with the method of claim 1 and threads of all the pin members have been phosphated or anodized.

4,513,996

TUBE COUPLING

Ralph Jost, Füllinsdorf, Switzerland, assignor to Hobas-Engineering AG, Switzerland

Filed Jun. 1, 1982, Ser. No. 384,003

Claims priority, application Switzerland, Jun. 17, 1981, 3990/81

Int. Cl.³ F16L *17/02*

U.S. Cl. 285—110 **6 Claims**

1. A tube coupling for coupling together one tube to another tube having predetermined interior and exterior diameter, comprising an outer sleeve having an interior bore, a sealing element lining said bore of an elastic material having an exterior positively engaged with said sleeve in its bore and having an interior formed substantially summetrically in respect to its radial mid plane and including at each end a plurality of inwardly directed sets of sealing protuberances following each other with cavities adjacent each protuberance into which it may be deflected by an engaged tube, and a central separating

flange between said sets of sealing protuberances defining an interior flange wall of a diameter substantially equal to the interior diameter of the associated tube to be coupled and having an end wall at each axial end of said flange forming a tube end stop, the axial length of said flange being a multiple of its radial height, said sealing element having at least one substantially annular cavity defined therein in the vicinity of said flange for taking up the material of the flange upon stressing of the flange by the inward pressure of the coupled tubes.

4,513,997

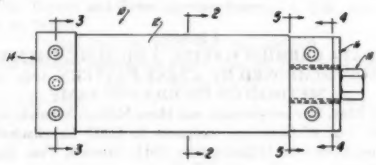
FITTING FOR AN INFLATABLE TUBE

Venkat R. Garlapaty, Utica, Mich., assignor to Greenco Corporation, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 431,846

Int. Cl.³ F16L *33/00*

U.S. Cl. 285—242 **9 Claims**



1. An expansion device comprising:

a resilient inflatable tube having open ends,

a first plate and a second plate, each plate having a convex central portion intermediate two flat portions,

a resilient bushing having a substantially cylindrical body and two flat end portions which extend radially outwardly from opposite sides of said body, said end portions being substantially coplanar, said body having an axial throughbore and said bushing being insertable into one end of said tube,

a fluid coupling having an elongated stem and a fluid connector on one end of the stem, said stem being insertable through said body throughbore so that said fluid connector is positioned axially adjacent said body,

said plates being positioned on opposite sides of said one end of said tube so that said tube and said bushing are sandwiched between said plates, said body being positioned between said convex central portions of said plates,

means for compressably securing said plates together, said securing means comprising at least two threaded fasteners, one fastener extending through said plates and one flat end portion and the other fastener extending through said plates and the other flat end portion wherein upon tightening of said fasteners, said tube compresses against said bushing and said bushing compresses against said fluid coupling, and

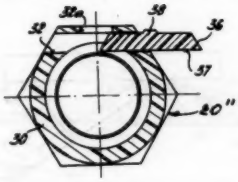
means for closing the other end of said tube.

4,513,998

CONNECTING NIPPLE FOR CIRCUMFERENTIALLY RIBBED INSULATING TUBES

Alfred Grossauer, Korbackerweg 7, CH-5502 Hunzenschwil, Switzerland

Filed Aug. 13, 1982, Ser. No. 407,733
Claims priority, application Switzerland, Jul. 9, 1981, 5748/81
Int. Cl.³ F16L *37/00*
U.S. Cl. 285—308 **1 Claim**



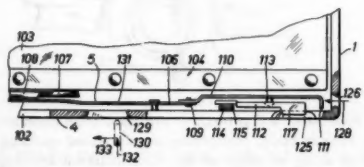
1. A connecting nipple for engagement with a tube having a circumferential surface with a locking groove therein, comprising a cylindrical body defining a socket portion and having an open end to which the tube is engageable, a tangential hole extending through said socket portion tangentially into an interior thereof and defining a socket wall, a locking slide engageable in said tangential hole and being of a size to engage in a locking groove of the tube, said socket wall having a bore therethrough overlying said locking slide when said locking slide is in said hole, said locking slide having a projection thereon which extends in said bore with said slide in said hole for holding said slide in said hole, said projection being sufficiently elastic so that said slide can be forced into said tangential hole while said projection passes said socket wall into said bore.

4,513,999

CASSETTE FASTENING STRUCTURE

Reiner Gollwitzer, Augsburg, Fed. Rep. of Germany, assignor to Regogollwitzer GmbH and Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 164,377, Jun. 30, 1980, abandoned, which is a continuation of Ser. No. 29,408, Apr. 12, 1979, abandoned, which is a continuation of Ser. No. 939,611, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 745,679, Nov. 29, 1976, abandoned. This application Apr. 9, 1981, Ser. No. 252,479
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553671; Feb. 18, 1976, 7604823
Int. Cl.³ E05C *1/16;* **A45C** *13/10*
U.S. Cl. 292—161 **9 Claims**



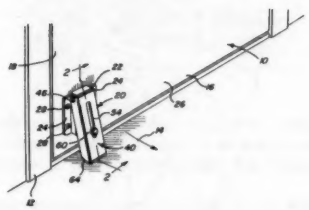
1. A device for opening and closing photographic cassettes, which cassettes include a frame having opposite longitudinal sides and a lid hinged at one longitudinal side of the frame, comprising a closure system situated along the other longitudinal side of the frame, which closure system includes a locking rod displaceable parallel to the longitudinal side of the frame and preloaded in one direction of displacement by spring means and having a set of locking elements which when the lid is pressed shut come into engagement with a second set of locking elements on the lid and which may be disengaged by displacement of the locking rod, said locking rod being constructed in two parts and comprising a section which is guided in a longitudinally displaceable manner on the cassette frame and a section coupled pivotably on the one extremity of the first-mentioned locking rod section at right angles to the plane of the cassette, the second-mentioned locking rod section having a free extremity and being coupled via a slot and pin joint to a closure lever which is pivotally journalled on the cassette frame at right angles to its plane and wherein in the area of the locking rod the cassette frame has excisions for insertion of an entraining element and the locking rod has engagement portions in the area of the excisions, one of which is at the free extremity of the second-mentioned locking rod section, for impingement of the entraining element.

4,514,000

SPRING BIASED DOOR STOP HAVING A VERTICALLY MOVABLE TENSION MEMBER

Jimmie A. Chezem, Sparta, and Gary E. Burks, Pikeville, both of Tenn., assignors to Plateau Products Corporation, Sparta, Tenn.

Filed Jan. 20, 1983, Ser. No. 459,590
Int. Cl.³ E05C *17/54*
U.S. Cl. 292—338 **15 Claims**



1. A door stop including a base for stationary mounting upon a door and including an elongated upright guide for support adjacent the lower marginal edge portion of the surface of the door which faces in the direction in which the door is moved toward the open position, a vertically elongated prop member pivotally mounted at its upper end from an upper portion of said guide for oscillation about a horizontal axis generally paralleling said surface and for movement between a first inoperative downwardly and outwardly inclined position with the lower end of the prop member disposed at a high level and a second operative position with the lower end of said prop member swung inward and downward to a low level to project at least slightly below said lower marginal edge portion for engagement with a horizontal surface over which said lower marginal edge moves when said door is shifted toward the open position thereof, means operatively connected between said base and prop member yieldingly biasing the latter toward said inoperative position, and elongated tension member means extending between said guide and prop member and including opposite end portions thereof slidably anchored to the guide and prop member for guided gravity movement downwardly therealong and with said tension member means preventing movement of said prop member toward said inoperative position from an operative position thereof independent of upward movement of said tension member means along said prop member and guide, wherein said guide and prop member include registered upstanding slots formed therethrough, said tension member means comprising an elongated tension member having its opposite ends slidably received through said slots and equipped with enlarged head means on the terminal ends thereof disposed on remote sides of said slots, wherein said tension member includes an elongated rigid rod member, the length of said rigid rod member

enabling the prop member to swing to said inoperative posi-

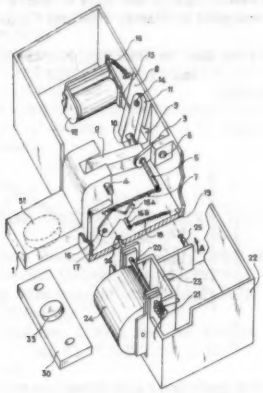
tion when the rigid member is moved upwardly in the slots toward the pivot axis, said rigid member falling by gravity away from the pivot axis as the prop member swings toward said operative position until the lower end thereof contacts the floor, said rigid member automatically and positively retaining the prop member in any position to which it is moved when the lower end contacts the floor.

4,514,001

ELECTRO-MECHANICAL LOCK

Antonio D. Garcia, Alcorcon, Spain, assignor to Segutronica, S.A., Alcorcon, Spain

Continuation-in-part of Ser. No. 322,622, Nov. 18, 1981, abandoned. This application Jun. 14, 1984, Ser. No. 621,123
Claims priority, application Spain, Nov. 21, 1980, 254.587[U]
Int. Cl.³ E05B *15/02*; E05C *3/16*
U.S. Cl. 292—341.16 **8 Claims**



1. An electro-mechanical lock comprising:
(a) a housing having a wall with a channel therein;
(b) a bolt rotatably mounted on said housing, said bolt being rotatable between extended and open positions;
(c) a connecting rod articulated to said bolt;
(d) a crank articulated to said connecting rod by means of a pin having a head extends away from said connecting rod, said crank further being articulated to said housing;
(e) a spring coupled to said pin;
(f) said crank and connecting rod providing an over-center arrangement such that said spring is fully extended when said bolt is between its extended and open positions and said spring urges said bolt to both its extended and open positions;
(g) said head of said pin moving into said channel when said bolt is rotated to its open position;
(h) means for selectively blocking said channel whereby said pin is selectively blocked from entry into an exit from said channel; and
(i) an electromagnet for operating said blocking means.

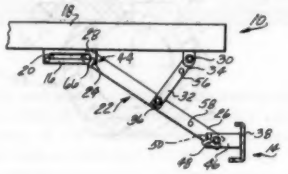
4,514,002

TWO-POSITION BUMPER

Donald S. McIntosh, Davisburg, Mich., assignor to John D. McIntosh and Mike Charles Giegler, both of Highland, Mich., part interest to each

Filed Mar. 8, 1982, Ser. No. 356,094
Int. Cl.³ B60R *19/02*
U.S. Cl. 293—118 **5 Claims**

1. A two-position bumper for off the road vehicles comprising:
a cam plate affixed to the vehicle frame and having a longitudinal cam slot formed therein;
a pivoting longitudinal member including a front end and a rear end, a cam follower pin laterally projecting from the front end to slidingly and pivotally engage the cam slot and pivotally and slidingly support the front end of the pivoting longitudinal member;
a rear pivot support attached to the vehicle frame a distance rearward from said cam plate;
an intermediate support arm pivotally supported at an upper



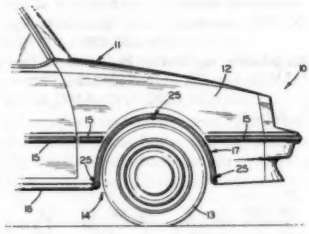
end by said rear pivot support and pivotally attached at a lower end to said pivoting longitudinal member;
the bumper attached to said rear end of said longitudinal member, whereby the bumper is movable from the first position in proximity with and rearward of the vehicle frame to clear ground obstacles for off the road travel, to a second position downward and rearward from the vehicle frame, the bumper serving as a conventional bumper in both of the first and second positions;
means for securing the bumper in the first position; and
means for securing the bumper in the second position.

4,514,003

MOUNTING OF AUTOMOBILE TRIM STRIPS

Robert R. Guy, North Royalton, Ohio, assignor to LOF Plastics Inc., Detroit, Mich.

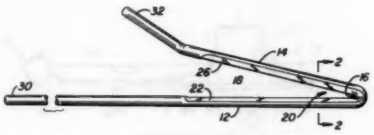
Filed Sep. 14, 1981, Ser. No. 301,778
Int. Cl.³ B62D *25/16*
U.S. Cl. 293—128 **2 Claims**



1. A decorative and protective ornamentation upon an automotive vehicle body, comprising an elongated molding strip extending along an edge of the sheet material forming said body and including a main body portion, a first surface on said main body portion adapted to face a corresponding surface of said vehicle body, means adhesively securing said molding strip throughout its length to said vehicle surface, a second surface on said main body portion opposite said first surface and including a bulbous rib projecting outwardly thereof, and a spring clip having an arcuate portion of complementary configuration hooked over said bulbous rib and engaging said vehicle body at at least one selected location along said strip, said clip urging said corresponding surfaces together and preventing failure of said adhesive securing means and separation

of said molding strip from said vehicle surface due to excessive stresses at said location.

4,514,004
WIRE-ROUTING DEVICE
John M. Morgan, 230 Echo Summit, Vallejo, Calif. 94590
Filed Jul. 14, 1983, Ser. No. 513,556
Int. Cl.³ B25B *27/00*
U.S. Cl. 294—19.1 **9 Claims**

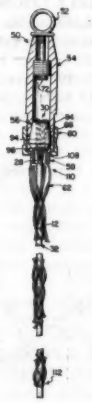


1. A device adapted to be mounted on a pole and used for routing a length of wire or the like across an inaccessible area, said device comprising:

a member having a pair of opposed edges meeting in an acute angle to define an angulated hook for snagging said wire, said edges being provided with friction means for retaining a snagged wire within said angulated hook; and

means for mounting said member on said pole.

4,514,005
FIBER OPTIC CABLE GRIP
David E. Fallon, Pawcatuck, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.
Filed Apr. 15, 1983, Ser. No. 485,322
Int. Cl.³ F16L *3/00;* **G02B** *7/26*
U.S. Cl. 294—86.42 **12 Claims**



1. A grip for pulling fiber optic cable including an optical fiber core, a strength member located adjacent the core and an outer jacket enclosing the strength member with an exposed end of the strength member extending therefrom, the combination comprising:

a hollow member having a lead end and a tail end and an inner surface;

a pulling eye coupled to said hollow member lead and;

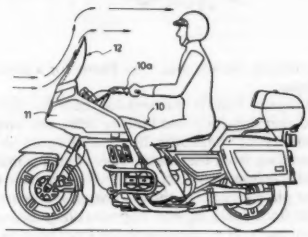
a wire mesh sleeve coupled to said hollow member at said tail end thereof and adapted to receive the fiber optic cable therein and grip the outer jacket thereof; and

coupling means, coupled to said hollow member, for coupling the exposed end of the strength member to said hollow member for increased support during pulling,

said coupling means comprising

means for releasably clamping the strength member directly against said inner surface and under an outwardly directed clamping force.

4,514,006
SYNTHETIC RESIN WINDSCREEN FOR MOTORCYCLES, MOTOR TRICYCLES, ETC.
Sigehiro Maruoka, Ohmiya, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan
Filed Nov. 16, 1982, Ser. No. 442,099
Claims priority, application Japan, Nov. 17, 1981, 56-184287; Nov. 17, 1981, 56-184288
Int. Cl.³ B62J *17/02*
U.S. Cl. 296—78.1 **4 Claims**



1. A molded synthetic resin windscreen for use with a motor vehicle having a vehicle body and means for substantially vertically mounting the windscreen onto the vehicle body, comprising:

a fitting edge portion adapted to be fixed to said windscreen mounting means;

a screen surface main portion having a platelike configuration and extending upwardly from said fitting edge portion; and

a screen surface peripheral edge portion extending along an outer periphery of said screen surface main portion, amd forming a whole outer perimeter of said windscreen in cooperation with said fitting edge portion,

said screen surface peripheral edge portion comprising a first curved portion facing forwardly of the vehicle body and having a predetermined radius of curvature, and a second curved surface portion facing rearwardly of the vehicle body and having a radius of curvature larger than said predetermined radius of curvature of said first curved portion;

said screen surface main portion being curved forwardly of the vehicle body with a radius of curvature thereof kept substantially constant from a portion thereof adjacent said fitting edge portion to a portion thereof adjacent said screen surface peripheral edge portion,

said screen surface main portion having a thickness gradually and continuously decreasing from a portion thereof adjacent said fitting edge portion to a portion thereof adjacent said screen surface peripheral edge portion;

said fitting edge portion, said screen surface main portion and said screen surface peripheral edge portion being integrally formed in one piece and having thicknesses different from each other while being sufficient for ensuring respective required values of mechanical strength thereof;

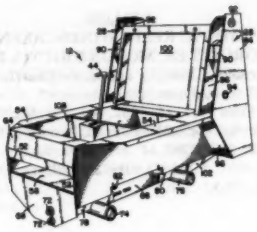
the thickness of said windscreen becoming smaller in the order of said fitting edge portion, said screen surface peripheral edge portion, and said screen surface main portion.

4,514,007

VEHICLE FRAME

Jon A. Macht, Owatonna, Minn., assignor to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Dec. 7, 1982, Ser. No. 447,667
Int. Cl.³ B62D *11/04*
U.S. Cl. 296—183 **18 Claims**



1. A unitary, monocoque-type frame for a skid steer loader, comprising:

an elongate, hollow transmission case having closed front and rear ends, top and bottom sides, and lateral sides;

a plurality of longitudinally spaced apart axles housings extending from the lateral sides of said transmission case, said axle housings being arranged in opposite coaxial pairs;

a floor plate secured to the top side of said transmission case, said floor plate having opposite longitudinal edges and front and rear portions with the front portion extending at least to the front end of said transmission case and the rear portion extending beyond the rear end of said transmission case;

a pair of longitudinal side plates secured to said floor plate in laterally spaced apart relationship outward from said transmission case, said side plates having generally vertical lower portions and upper portions with the upper portions of said side plates being formed into fenders and the lower portions being secured along the longitudinal edges of said floor plate;

a front cross member secured between said side plates;

a brace secured between each axle housing, lower portion of the associated side plate, and said transmission case;

a pair of uprights secured in laterally spaced apart relationship to the rear portion of said floor plate, each upright also being secured to the associated side plate; and

a rear cross member secured between said uprights and said side plate in spaced relationship with said floor plate.

4,514,008

VEHICLE BODY FLOOR CONSTRUCTION OF MOTOR VEHICLE

Hiroyuki Watanabe, and Yasushi Tanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 374,937
Claims priority, application Japan, Jun. 5, 1981, 56-87234; Jun. 12, 1981, 56-90275; Jun. 12, 1981, 56-86600[U]
Int. Cl.³ B62D *27/02*
U.S. Cl. 296—204 **20 Claims**

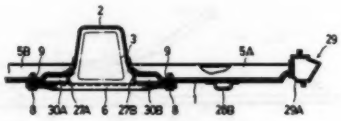
1. A vehicle body floor construction of a motor vehicle, comprising:

(a) an upwardly projecting and downwardly opening tunnel disposed in a longitudinal direction of a vehicle and formed at the central portion of a transverse direction of a floor panel of said vehicle, said tunnel having a first end and a second end;

(b) a fuel tank disposed in said tunnel;

(c) a first pair of cross members integrally formed in the transverse direction on said floor panel, said cross members traversing said tunnel at a forward end and at a rear end of said fuel tank and substantially at the bottom level of said fuel tank disposed in said tunnel to block said tunnel and protect said fuel tank;

(d) a second pair of cross members comprising a left cross member and a right cross member connected to said floor panel in the transverse direction, a first end of said left cross member and a first end of said right cross member being connected to opposite outer side surfaces of said tunnel at a point which is substantially equidistant in the longitudinal direction from said first end and said second end of said tunnel;



(e) a bulkhead traversing the opening of said tunnel below said fuel tank disposed therein, said bulkhead being connected to said floor panel at a point which is substantially equidistant in the longitudinal direction from said first end and said second end of said tunnel formed therein; and

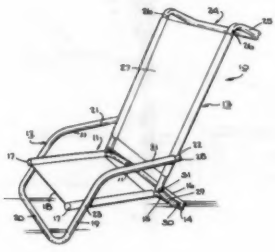
(f) at least two longitudinally extending closed cross-sectional reinforcing portions integrally formed on said floor panel at transversely opposite sides of the opening of said tunnel, said closed cross-sectional reinforcing portions extending for at least the length of said fuel tank.

4,514,009

COLLAPSIBLE LOUNGE CHAIR

Robert D. Vanderminden, Granville, N.Y., and Paul Parker, Poultney, Vt., assignors to The Telescope Folding Furniture Co. Inc., Granville, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,627
Int. Cl.³ A47C *4/00, 1/02*
U.S. Cl. 297—27 **7 Claims**



1. A collapsible lounge chair comprising

a seat frame defining a first leg support;

an arm frame pivotally connected to said seat frame and defining a second leg support, said arm frame including a pair of telescoping arms; and

a back frame pivotally mounted on said seat frame to move between a raised upright position and a lowered reclined position and between said upright position and a collapsed position, said back frame having a projecting portion at one end to define a third leg support in said lowered position and being pivotally secured at an intermediate portion to each telescoping arm.

4,514,010
ARRANGEMENT FOR THE DISTRIBUTION OF PRESSURIZED FLUID TO A SEAT UNIT HAVING A BACKREST

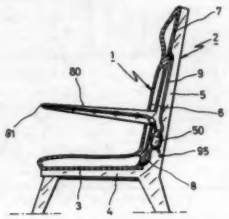
Buenaventura Sabater González, Denia 23, Barcelona, Spain

Filed Apr. 21, 1983, Ser. No. 487,054

Claims priority, application Spain, May 6, 1982, 264.985; Jan. 22, 1983, 269.906

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—284 **9 Claims**



1. An arrangement for the distribution of pressurized fluid to a seat unit having a backrest and a seat area, comprising:

(a) a first fluid-containing chamber adaptable to the seat area of the seat unit so as to receive, at least in part, the user's weight;

(b) at least one inflatable chamber adaptable to the backrest;

(c) lines communicating between said first chamber; and each at least one backrest chamber; and

(d) normally closed valve means connected to each of said lines, the valve means including

(i) at least one opening means having an opening control and being positioned in the seat unit so as to be easily accessible to the user thereof,

(ii) a valve body with two access ports to the interior thereof,

(iii) at least one valve seat; and

(iv) a stopper made from relatively lightweight material for bearing against each said valve seat,

wherein the or each valve seat comprises a resilient washer positioned between the stopper and one of the access ports, and wherein the opening means is associated with each washer forming each valve seat, is capable of penetrating from the space opposite that occupied by the stopper in the washer orifice and preventing the stopper from seating against the valve seat, is partially housed in a sealed tubular member fixedly attached to the valve body and comprises a filiform member moveable in a longitudinal direction and a spring member urging the filiform member away from the washer orifice, the opening control causing such longitudinal movement.

4,514,011
POWER AND LIQUID SUPPLY SYSTEM FOR MINING MACHINES

Klaus Lodwig, Bochum, and Friedhelm Schefers, Dortmund-Brackel, both of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

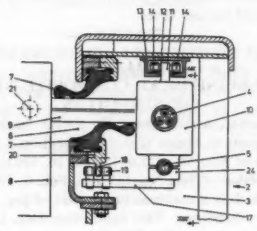
Filed Jul. 15, 1983, Ser. No. 514,301

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3229989

Int. Cl.³ E21C *27/34*

U.S. Cl. 299—42 **9 Claims**

1. In a mining machine arrangement wherein a mining machine is adapted to traverse an elongated course of travel along a mine face, the combination comprising: a housing structure extending along the course of travel adjacent one side of the mining machine, the interior of said housing accommodating extended lengths of a power supply cable and a liquid supply conduit which are coextensive with at least a portion of the course of travel of the mining machine, said housing having a face plate provided with an elongated slot extending along the course of travel of the mining machine, a side arm mounted on the mining machine and extending through said slot, a junction box rigidly carried on an end of said side arm within said interior of said housing, junction means within said junction box for connecting power cable means leading from said mining machine to said extended length of power cable in the



interior of said housing, and coupling means carried by said arm for coupling a liquid supply conduit leading from the mining machine to said extended length of liquid supply conduit in the interior of said housing structure, and said side arm being mounted on the mining machine for relative movement with respect thereto during traverse of the mining machine over its course of travel to facilitate guiding of said junction box within said interior of said housing.

4,514,012
EXCAVATORY MACHINE FOR USE IN COAL AND OTHER MINING OPERTIONS

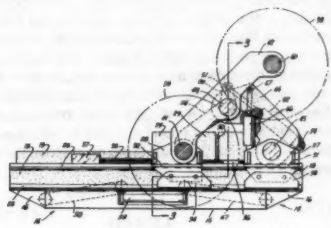
John L. Wallace, Woonona, Australia, assignor to Maintel Pty. Limited, New South Wales, Australia

Filed Jul. 25, 1983, Ser. No. 516,730

Claims priority, application Australia, Jul. 28, 1982, PF5092

Int. Cl.³ E21C *27/24*

U.S. Cl. 299—57 **25 Claims**



1. An excavatory machine, for use in a mine presenting a face from which work is commenced and sustained, said machine consisting of a machine base structure, means to advance said base structure along the floor of said mine and towards said face and a cutter-head assembly mounted on said base structure for excavatory presentation to said face, said machine comprising:

a saddle mounted on and reciprocatable from side-to-side of said base structure and having two interconnected parts adjustably spaced apart, said parts having means to hold them in selected adjustment of one relative to the other,

means applied to one of said parts to reciprocate said saddle as aforesaid,

a first lever fulcrumed on said one of said parts,

means for varying the angular disposition of said first lever

relative to said saddle and for holding said first lever in selected angular disposition relative to said saddle,

a second lever medially fulcrumed on the free end of said first lever,

the other of said parts being linked to the fulcrum of said second lever,

means for part rotating said second lever between angularly spaced-apart positions therefor and for holding said second lever in a selected one of those positions, and

a pair of power-rotatable cutters respectively borne on the ends of said second lever.

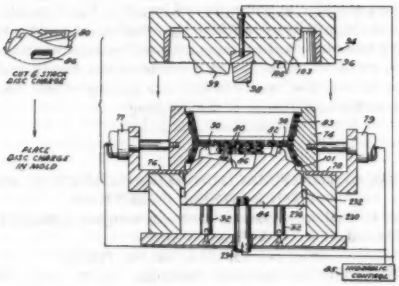
4,514,013
FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION

James A. Woelfel, and Richard W. Smith, both of Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Continuation of Ser. No. 277,657, Jun. 26, 1981, abandoned, which is a division of Ser. No. 119,128, Feb. 6, 1980, Pat. No. 4,294,639, which is a continuation-in-part of Ser. No. 14,265, Feb. 22, 1979, abandoned. This application Dec. 12, 1983, Ser. No. 559,623

Int. Cl.[3] **B60B** *5/02*

U.S. Cl. 301—63 PW **19 Claims**



1. A composite wheel construction of fiber-reinforced resin comprising a disc portion wherein reinforcing fibers comprise discontinuous fibers disposed predominantly in multiple axially distinct layers and oriented in each of said layers substantially randomly of the wheel axis, and a rim portion integral with said disc portion wherein reinforcing fibers include discontinuous fibers at least some of which are oriented substantially circumferentially of the wheel axis and in which said fibers are disposed predominantly in multiple essentially radially distinct circumferential layers.

4,514,014
INTEGRAL IDLER TRACK ADJUSTING AND RECOIL APPARATUS

David J. Balzer, East Peoria; Thomas M. Dennison, Peoria; Marvin G. Getz, and Eldon D. Oestmann, both of Morton, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00545, § 371 Date Apr. 26, 1982, § 102(e) Date Apr. 26, 1982

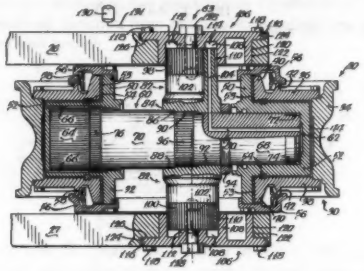
PCT Filed Apr. 26, 1982, Ser. No. 388,765

Int. Cl.[3] **B62D** *55/30*

U.S. Cl. 305—10 **4 Claims**

1. In a track laying vehicle (**10**) of the type having a continuous track assembly (**12**) driven about a track frame (**26, 27**), an idler (**20**) engaging said track assembly **912**), a cross member (**82**) connected to said frame (**26, 27**) and extending into said idler (**20**), means for adjusting the position of the idler (**20**) to tension the track assembly (**12**) and recoil means for providing recoil to said idler (**20**), the improvement comprising:

said adjusting means (**68, 62**) including a piston (**68**) and a cylinder (**62**) within said idler (**20**) and being adapted to adjustable journal said idler (**20**) to said cross member (**82**), said adjusting and recoil means includes means (**80**) for interposing fluid between said piston (**68**) and cylinder (**62**) and adjusting the relative position of said idler (**20**) relative to said cross member (**82**), and an accumulator



(**146**) in fluid communication with said cylinder, said accumulator (**146**) being annular and further including a piston (**148**) adapted to be displaced within said accumulator (**146**) in response to receipt of fluid from said cylinder (**62**), said piston (**148**) being biased to return fluid into said cylinder (**62**).

4,514,015
BALL AND SOCKET LINKAGE AND BEARING ASSEMBLY

Jack W. Sullivan, 2236 Island Beach Rd., Oshkosh, Wis. 54901

Continuation of Ser. No. 110,196, Jun. 7, 1980, abandoned, which is a continuation of Ser. No. 13,149, Feb. 21, 1979, abandoned, which is a division of Ser. No. 859,325, Dec. 12, 1977, Pat. No. 4,164,062. This application Oct. 10, 1980, Ser. No. 195,887

Int. Cl.[3] **F16C** *17/10, 19/10*

U.S. Cl. 308—2 R **7 Claims**

1. An assembly comprising,

inner metallic means having an axis and having outwardly facing curved metal contact surfaces constrained against axial movement by a unitary structure,

an outer metallic member having an integral inwardly facing curved metal surface mating with said contact surfaces more than 90° as measured in a plane including said axis,

the curved surface of said outer member engaging said contact surfaces for more than 180° as measured about said axis,

said outer member including a flat portion integral with the curved surface and lying in a plane normal to said axis and extending inwardly from said inwardly facing curved metal surface past the center of curvature of said contact surfaces,

said inner means including an integral continuous metallic inner race and a multiplicity of balls between said race and the outer member,

each of the balls having an outwardly facing contact surface mating with the curved surface of the outer member,

said inner race being said unitary structure and embracing more than 90° of each ball as measured in a plane including said axis and having an integral flat portion parallel to the first named flat portion and extending from the curved surface of the inner race past the center of the balls,

the integral curved metal surface of the outer member being a continuous outer race,

neither of the races being split.

4,514,016

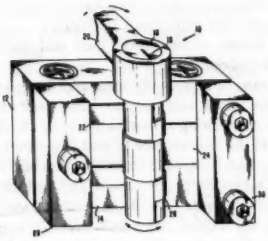
LOW FRICTION PIVOT

Roland O. Davis, Santa Ynez, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 295,053, Aug. 21, 1981, Pat. No. 4,438,983. This application Oct. 14, 1983, Ser. No. 541,941

Int. Cl.³ F16C *32/00*

U.S. Cl. 308—2 A **3 Claims**



1. A pivot structure comprising:

a flat base member;

a cylindrical pivot pin member;

band means including metallic bands each having a first portion and a second portion, with said first portion affixed by way of first affixing means to said cylindrical member and said second portion affixed by way of second affixing means to said flat base member, one of said bands extending around said cylindrical member in a first circumferential direction and another of said bands extending around said cylindrical member in a second circumferential direction opposite from said first direction, the thickness of said metallic bands being such that said bands are not stretched beyond their fatigue limit, said bands configured so that the bending forces of said pivot pin are substantially balanced;

said bands interposed between said pivot pin member and said flat base member;

said interposed bands abutting said flat base member on one side of said bands;

said interposed bands abutting said pivot pin member on the opposite side of said bands;

said flat base member and said interposed bands limiting movement of said pivot pin member in a direction towards said flat base member;

said flat base member positioned as a load bearing support surface for said pivot pin means and said interposed band means; and

said flat base member serving to support loads on said pivot pin member which are directed normal to and towards said flat base member and transmitted through said interposed band means;

wherein there are three bands, with two of said bands extending around said pivot pin member in one circumferential direction and a third band extending around said pivot pin in the opposite circumferential direction;

and wherein said bands are of substantially equal thickness and the width of said third band is substantially equal to the sum of the widths of the two other bands.

4,514,017

ROLLING BEARING FOR LENGTHWISE MOVEMENT

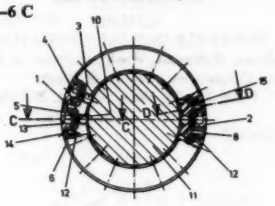
Lothar Walter, Schweinfurt, and Walter Reith, Bad Bocklet, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,122

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207516

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **8 Claims**



1. In a rolling bearing for lengthwise movement having circumferentially distributed endless rows of rolling bodies, a support having first axially extending channels in its outer surface, said support radially outwardly supporting the loaded rolling bodies, and a cage for guiding the unloaded rolling bodies in the reverse direction and turning them around at the ends of the support; the improvement wherein the support is deformed to have a corrugated or undulating cross-section in the circumferential direction, the corrugations or undulations extending throughout the axial length of the support and defining second axially extending channels for the rolling bodies.

4,514,018

LINEAR SLIDE BEARING AND LINEAR SLIDE TABLE UNIT EMPLOYING THE SAME

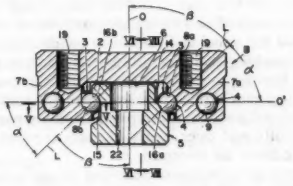
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 567,980

Claims priority, application Japan, Apr. 21, 1983, 58-69237

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **15 Claims**



1. A linear slide bearing comprising:

a slide block constituted by a block body of U-shaped cross-section having on the inner surfaces of both arms thereof a pair of right and left obliquely upward and downward directed raceways extending longitudinally thereof, said block body further having non-load carrying ball bores

longitudinally extending through solid portions of said arms;

a track shaft fitted in a recess of said slide block so as to be slidable longitudinally thereof, said track shaft being formed on both its side portions facing the inner surfaces of both the arms with obliquely upward and downward directed raceways facing the raceways on said arms, respectively, to form load carrying ball grooves in cooperation with these raceways;

a pair of side covers attached to both side surfaces of said slide block and having respective guide grooves for providing communication between said load carrying ball grooves and the associated non-load carrying ball bores, respectively; and

a multiplicity of balls accommodated in two rows of endless tracks formed by said load carrying ball grooves, non-load carrying ball bores and guide grooves, said balls being adapted to recirculate through the insides of said endless tracks.

4,514,019

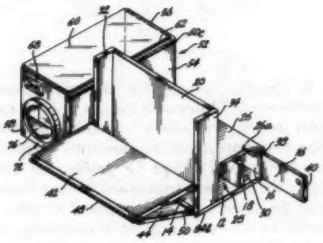
PORTABLE DENTAL OPERATORY

Peter E. Moore, Redmond, Wash., assignor to Mobile Dental Equipment Corporation, Redmond, Wash.

Filed Jul. 20, 1981, Ser. No. 285,155

Int. Cl.³ A47B *43/00*

U.S. Cl. 312—209 **24 Claims**



1. A portable dental operatory comprising:

a cabinet, said cabinet including a generally rectangular base having front and rear sides, an upright tool support panel mounted on said base between said front and rear sides and extending substantially parallel to said front and rear sides, a front panel having first and second opposite edges, said front panel being hinged along said first edge to said front side of said base for swinging motion between an upright position wherein said front panel is substantially parallel to said tool support panel and a substantially horizontal position wherein said front panel extends from said base to form a work surface positioned in front of said tool supprt panel, a top panel having first and second edges, said first edge of said top panel being hinged to said second edge of said front panel for relative folding motion of said top panel and said front panel, connecting means for attaching said second edge of said top panel to said base beneath said first edge of said front panel such that said top panel braces said front panel in said substantially horizontal position, and whereby said top panel is foldable upwardly and over said tool support panel to assemble said cabinet for transport;

an electric air compressor mounted on said base behind said tool support panel; and

a removable enclosure mountable on said base behind said tool support panel so as to enclose said air compressor, said removable enclosure including a rear wall and opposing end walls, said removable enclosure further including a substantially transparent top panel hinged to the upper edge of said rear wall, means for attaching said enclosure to said cabinet, and connecting means for attaching said second edge of said top panel to said removable enclosure so as to assemble the operatory for transport.

4,514,020

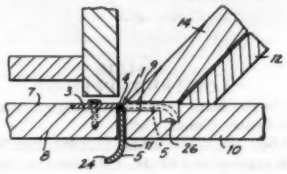
DESK LOCK SYSTEM

Thomas Strasser, 15 Glens Dr. E., Boynton Beach, Fla. 33436

Filed Jun. 9, 1983, Ser. No. 502,758

Int. Cl.³ E05C *7/06*

U.S. Cl. 312—220 **12 Claims**



1. A lock system for a desk including:

adjacent first and second door panels each hving an interior face and open and closed positions;

locking means to selectively lock said second panel in its closed position;

hinge means to selectively lock said first panel in its closed position when said second panel is locked, said hinge means comprising a first hinge plate attached to the first panel at the interior face of said first panel, a second hinge plate which protrudes from between said first and second panel when they are closed and unlocked, and which abuts the interior face of the second panel when they are closed and locked; and a joint means pivotally connecting said first and second hinge plates and having a limited angle of rotation; wherein the interior faces of said first and second panel doors are co-planar when they are in their closed and locked positions.

4,514,021

CABINET WITH DOUBLE DOOR CONSISTING OF AN INNER DOOR AND AN OUTER DOOR

Gunter Sundermeier, Bunde, and Dieter Waltemate, Hullhorst, both of Fed. Rep. of Germany, assignors to Paul Hettich & Co., Kirchlengern, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,774

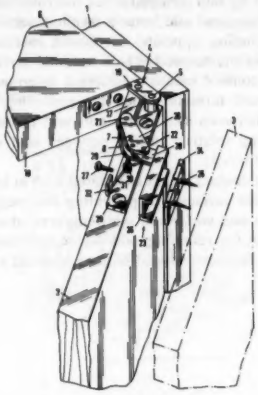
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215607

Int. Cl.³ E05F *17/00*

U.S. Cl. 312—291 **11 Claims**

1. In a cabinet receptive of an appliance shell and having a double door including an inner door for the appliance shell and an outer door for the cabinet, hinging means mounted on the inner door and the appliance shell to enable the inner door to pivot on a given axis, the improvement comprising: at least one means coupling the outer door, the inner door and the shell of the appliance to effect the pivotal movement of the inner door about the given axis in response to the opening and closing of the double door and including drive means mounted for piv-

otal movement on the inner door about an axis parallel to the given axis and is connected to the outer door and the appliance



shell for forcing the outer door to one side and away from the given axis when the double door is opening.

4,514,022

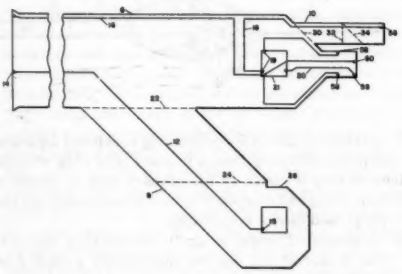
PROBE CABLE ASSEMBLIES

David G. Payne, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 29, 1983, Ser. No. 509,827

Int. Cl.³ H01R *23/72*; H01L *21/66*

U.S. Cl. 339—17 F **2 Claims**



1. A probe cable assembly for use in connecting a monitoring instrument to an electronic system under test, which system has a receptacle for receiving a multiple terminal electronic component, to analyze the interaction between the system and the component, said cable assembly comprising a flexible circuit cable having an instrument end, a probe end and an auxiliary interconnect end, a probe element secured to the cable at the probe end thereof and capable of fitting in the receptacle of the system under test, said probe element having a plurality of terminals, and an auxiliary receptacle for receiving the multiple terminal electronic component said auxiliary receptacle being secured to the cable and having a plurality of terminals in a predetermined array, and said cable comprising a plurality of conductors supported by a dielectric matrix, a first group of said conductors extending between said instrument end of the cable and the auxiliary interconnect end and terminating at said auxiliary interconnect end in an array corresponding to said predetermined array, and a second group of said conductors extending between the terminals of the auxiliary receptacle and corresponding terminals of said probe element, the cable being folded to bring the terminations of the first group of conductors into registry with the terminals of the auxiliary receptacle so that conductors of the first group are connected both to predetermined terminals of the auxiliary receptacle and to corresponding terminals of the probe element.

4,514,023

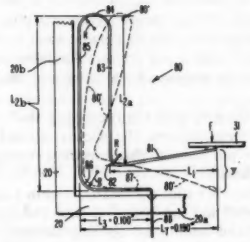
INTEGRATED CIRCUIT PACKAGE CONNECTOR

Rex Rice, Menlo Park, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 343,258, Jan. 27, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 552,605

Int. Cl.³ H01R *23/72*

U.S. Cl. 339—17 CF **12 Claims**



1. An electro-mechanical connector for connecting an integrated circuit package to an electronic system in a replaceable fashion; said connector including a frame having a plurality of electrical conductors mounted therein; and said frame being shaped to hold said integrated circuit package such that each electrical conductor of said plurality aligns with a corresponding lead in said integrated circuit package; wherein:

each electrical conductor is comprised of an elongated planar piece of material having four bends respectively at lengths L_1, L_{2a}, L_{2b} and L_3 along said conductor which make the maximum bending stress S in said conductor equal to $S=k_1F(L_1)$ and independently make the distance y by which said conductor deflects as said conductor pushes against said corresponding lead proportional to $y=k_2F(L_1)^3+L_1 \tan [k_3FL_1(L_{2a}+L_{2b})]$ where F is the force by which said conductor pushes and k_1, k_2, and k_3 are constants;

said lengths L_1, L_{2a}, L_{2b} and L_3 being straight and of the same order of magnitude;

a first one of said bends being a U-shaped bend which provides two legs;

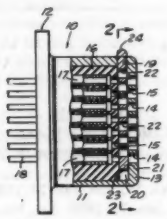
one of said legs having a second one of said bends of approximately 90° in a first direction at length L_{2a} from said U-shaped bend to thereafter provide a straight first leg portion of length L_1 for pushing against and making ohmic contact with a corresponding lead in said integrated circuit package;

the other of said legs having a third one of said bends of approximately 90° in said first direction at length L_{2b} from said U-shaped bend which is longer than said length L_{2a}, and having a fourth one of said bends of approximately 90° at length L_3 further along its length in a direction perpendicular to said first direction to thereafter provide a second leg portion for making ohmic contact with said electrical system.

4,514,024
SHIELDED ELECTRICAL CONNECTOR

Thomas A. Clark, Santa Monica, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Sep. 3, 1982, Ser. No. 414,918
Int. Cl.³ H01R 13/453
U.S. Cl. 339—40 4 Claims



1. An electrical connector having a metal receptacle shell within which at least one socket contact is carried within an insulative insert, and an open-ended metal plug shell adapted for fitting receipt onto the receptacle shell and including an insulative insert with a pin contact for interconnecting with socket contact on mating of the plug and receptacle shells, comprising:

a face wall integral with the receptacle shell and having an opening lying opposite the socket contact and through which the pin contact passes during mating of the plug and receptacle;

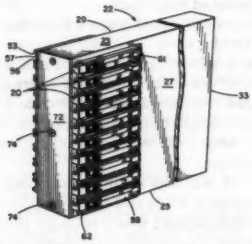
a platelike member slidably located within a cavity between the face wall and the insulative insert within the receptacle shell, and having an opening therein, said platelike member further having an edge that extends outwardly of the receptacle shell when the plug and receptacle shells are disengaged and which, on mating engagement of the plug and receptacle shells, means on the plug shell moves the outwardly extending plate-like member edge into the receptacle shell to a first position aligning the platelike member opening with the face wall opening; and

spring means urging the platelike member toward a second position where the face wall opening and the platelike member opening are out of alignment.

4,514,025
LOW RESISTANCE ELECTRICAL CONNECTOR

Aymon A. Maulandi, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Nov. 8, 1982, Ser. No. 440,137
Int. Cl.³ H01R 21/28, 11/22
U.S. Cl. 339—64 M 13 Claims



1. An electrical connecting assembly adapted for plug-in connection to a female conductor, said assembly comprising:

a terminal block portion including a first end adapted for insertion into said conductor, said terminal block having a top terminal surface, a bottom terminal surface and opposite side terminal surfaces;

a wafer carried by said terminal block intermediate said top terminal surface and said bottom terminal surface;

said wafer including opposite side wafer surfaces spaced outward from the respective side terminal surfaces;

first resilient contact means positioned intermediate said wafer and said terminal block for providing electrical connection between said wafer and said terminal block while enabling relative motion between said wafer and said terminal block;

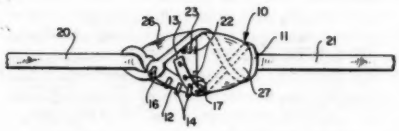
second resilient contact means associated with at least one of said wafer side surfaces for providing electrical connection between said wafer and said female conductor; and

retaining means for retaining said wafer intermediate said top terminal surface and said bottom terminal surface.

4,514,026
PLUG LOCKING DEVICE

Phil Herbert, 685 W. 1600 North, Mapleton, Utah 84663

Filed Sep. 2, 1983, Ser. No. 528,745
Int. Cl.³ H01R 13/62
U.S. Cl. 339—75 P 6 Claims



1. A retaining device for preventing accidental separation of an extension cord plug from a primary cord plug wherein the extension plug is mated to the primary plug by means of an insertion prong and receptacle which are carried in the respective plugs, said device comprising:

a flat, elongated, single, integrally formed strap having a first end, a second end and an intermediate section therebetween;

said first end having first male and female fastening means spaced apart at a sufficient distance to enable a portion of the strap between the first male and female fastening means to be wrapped around and fastened at one of the mated plugs;

said first end further including a second male fastening means which is positioned thereon such that it remains exposed when the first male and female fastening means are fixed around the plug;

said second end including a second female fastening means adapted for attachment to the second male fastening means of the first end;

said intermediate section having sufficient length to enable its placement around the second plug in a manner wherein the respective plugs are secured together so that plugs cannot be pulled apart;

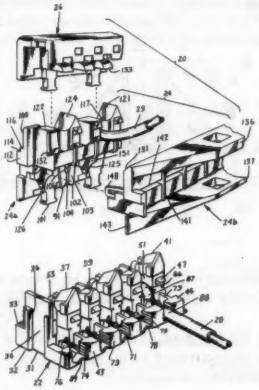
said single strap having sufficient overall length to permit the first end to be secured at one plug, the intermediate section to be wrapped at least once around the mated plugs, and the second end to be returned and attached to the first end at the original plug.

4,514,027

CONNECTORIZED CABLE AND METHODS OF MAKING

Roland H. Seidel, Cobb County, Ga., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,055
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—105 **14 Claims**



8. A connector for holding conductors of a cable in a spaced array, said connector comprising:

an elongated plastic member which includes a plurality of spaced grooves being defined by walls of said connector with portions of the conductor capable of being disposed in preselected grooves; and

a plurality of latching tabs which are adapted to be extended into the preselected grooves into securing relationship with the conductor portions therein and which are connected to said walls adjacent to inverts of said grooves to secure conductors against unintended movement, wherein each latching tab is integral with an associated one of said walls along one portion of the tab, which is adjacent and parallel to the groove defined by said associated wall, and along sides adjacent to said one portion, and wherein each said tab is formed by a partially separated portion of its associated wall which is adapted to be moved pivotally about said one portion and deflected inwardly into enclosing relationship with a conductor portion whereupon portions of said sides of each said latching tab are disconnected from its associated wall but interposed between the tab and its associated wall to maintain the tab locked in the enclosing relationship with the conductor portion.

4,514,028

CRT UPDATED METHOD AND APPARATUS FOR IDENTIFYING INTEGRATED CIRCUIT PINS

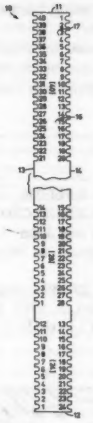
Wei H. Kuo, 3805 Avenue B, No. 201, Austin, Tex. 78751

Filed May 9, 1983, Ser. No. 492,565
Int. Cl.³ H01R *3/00*
U.S. Cl. 339—113 R **9 Claims**

1. An integrated circuit pin identifier for placement either between multiple pins of an integrated circuit which are arranged substantially in two rows or for placement against the outside edge of a row of pins of the integrated circuit, comprising:

a rectangular frame having opposite ends with a width less than the distance between the two rows of multiple pins, and having sides substantially longer than the width, the sides having a plurality of notches formed along at least one-half the entire length so that when at least one of the sides is placed adjacent the pins, each of the pins fits substantially inside one of the notches; and

labeling means placed on at least one face of the rectangular frame to correlate a predetermined notch with a predetermined number, said predetermined number representing the number of the adjacent pin of the integrated circuit.

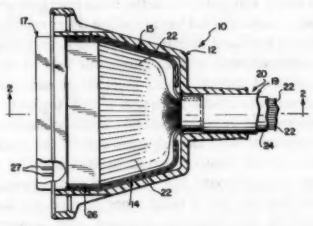


4,514,029

SHIELDED CONNECTOR AND METHOD OF FORMING SAME

Ronald G. Lax, Los Gatos; Robert G. Johnson, Santa Clara; Charles G. Henningsen, Portola Valley, and J. Scott Ellis, San Jose, all of Calif., assignors to Quintec Interconnect Systems, Mountain View, Calif.

Filed May 3, 1982, Ser. No. 374,287
Int. Cl.³ H01R *13/504, 13/658*
U.S. Cl. 339—143 R **11 Claims**



1. In a shielded connector for a shielded cable including a cable having a plurality of insulated conductors, an outer insulating jacket enclosing the conductors and a shield layer interposed between the conductors and the jacket with the conductors and the shield layer extending past an end of the insulating jacket; and a metallic connector housing coupled to an insulated terminal block which supports terminals electrically connected to the conductors, the improvement comprising:

a pair of opposed, rigid shield members located between the connector housing and the end of the insulating jacket and receiving the insulated conductors extending past the jacket therebetween;

means for interconnecting said opposed shield members;

means for electrically connecting and bonding said shield members to the shield layer;

means for electrically connecting and bonding said shield members to the connector housing;

a unitary, preformed and self-supporting outer housing enclosing said opposed shield members, a portion of the connector housing, and a portion of the insulating jacket therein, said outer housing comprising a continuous tube; and

adhesive means interposed between said outer housing and said shield members and between said outer housing and said portion of said insulating jacket so enclosed.

4,514,030

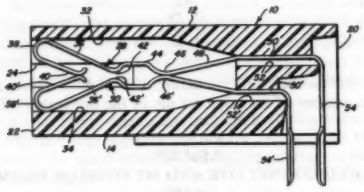
SHORTING EDGE CONNECTOR

Irvin R. Triner, Stickney, and John N. Martinowich, Warrenville, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Continuation of Ser. No. 296,898, Aug. 27, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 529,203

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—176 MP **6 Claims**



1. In an edge connector of the type having an insulative housing with an opening therein for receiving an edge portion of a printed circuit board, and two series of contacts mounted in opposed relation in said housing for engagement with opposite sides of the leading edge of a board inserted in said opening to make electrical contact with circuitry on the sides of said board, the improvement comprising, in combination said series of contacts being a plurality of deflectable contacts arranged in opposed pairs, each contact having a first outer contact portion which projects into said opening toward the opposing contact and makes engagement with the adjacent side of the leading edge of a printed circuit board inserted in said opening, a second intermediate contact portion which projects into said opening toward the opposing contact and also makes separate spaced engagement with the adjacent side of the leading edge of a printed circuit board inserted in said opening after the leading edge of said board has deflected and moved past said first contact portion, and a third inner contact portion which projects toward the opposing contact, said contacts being formed so that at least the third inner contact portions of an opposing pair of contacts are in engagement in the absence of a board in said opening, thereby shorting said contacts until the leading edge of a board has been inserted in engagement with said second contact portions, the outer end portions of said contacts being made elongated and sufficiently flexible that insertion of the leading edge of a printed circuit board past said first contact portions will effect only localized deflection of said first contacts into engagement with adjacent side of the board whereby said third contact portions will remain engaged at least until said board engages and deflects said second contact portions, and said second contact portions being sufficiently proximate in spaced relation to said third contact portions that deflection of said second contact portions by the leading edge of a printed circuit board will cause said third contact portions to separate thereby completing a circuit through said board, said contacts being formed so that said first outer contact portions of an opposing pair of contacts are also in engagement in the absence of a board in said opening.

4,514,031

RECOVERABLE ARTICLE

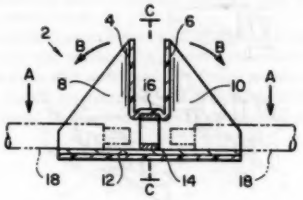
Richard Lionnet, Parmain, France, assignor to Raychem Pontoise, S. A., France

Filed Jun. 11, 1982, Ser. No. 387,371

Claims priority, application United Kingdom, Jun. 23, 1981, 8119347

Int. Cl.³ H01B *17/00;* **H01R** *4/10, 43/02*

U.S. Cl. 339—205 **12 Claims**



1. A recoverable article comprising an enclosure having two openings facing away from each other for receiving elongate substrates;

said enclosure having a recoverable state and a recovered state and in its recovered state, an axis along which the elongate substrates are disposed;

said enclosure in its recoverable state having the openings arranged so as to be capable of receiving the substrates translationally from a direction generally perpendicular to said axis;

said enclosure having a component of its recovery movement from said recoverable state to said recovered state towards the substrates and generally perpendicular to said axis;

said enclosure in its recovered state encloses the substrates and aligns the substrates with each other and with said axis.

4,514,032

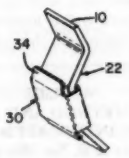
CONTACT ELEMENT

George J. Lawrence, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 31, 1983, Ser. No. 547,186

Int. Cl.³ H01R *3/00, 13/50*

U.S. Cl. 339—278 C **4 Claims**



1. An improved contact element for card edge connectors of the type having a card slot for receiving a circuit card and contact elements on each side of the card slot for interconnecting circuits on a circuit card located in the slot to circuits on a circuit board on which the connector may be mounted, said improved contact element comprising:

a. retaining means for being received in the connector and for retaining the element therein;

b. depending means attached to a lower end of the retaining means and for being attached to circuits on a circuit board on which the connector may be mounted;

c. an elongated cantilever beam attached to the retaining means and extending upwardly alongside a card slot in the

connector, said beam having a flat section located near a free end of the beam;

d. a noble-metal plated, convex surface located on the flat section and facing towards the card slot; and

e. a clip having a center plate with an outer surface being plated with a non-noble metal and an inner surface being plated with a noble metal and attaching means for slidingly attaching the clip to the flat section on the beam with the inner surface bearing against the convex surface and the outer surface facing the card slot for engagement with a circuit card which may be positioned therein.

4,514,033

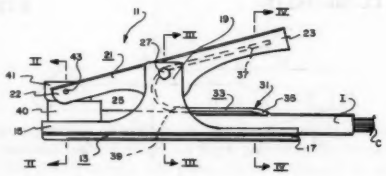
ARC WELDING CLAMP

Charles G. Matthews, 1647 Semmes, Memphis, Tenn. 38114

Filed Oct. 24, 1983, Ser. No. 544,470

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—255 P **7 Claims**



1. An arc-welding clamp for electrically joining an electrically conductive cable to an electrically conductive workpiece, said clamp comprising:

(a) an electrically nonconductive first member having first and second ends;

(b) an electrically nonconductive second member having first and second ends;

(c) an electrically conductive jaw member for being mounted on said first end of said first member and for being electrically coupled to the cable;

(d) pivot means for pivotally coupling said first and second members to one another intermediate said first and second ends thereof; and

(e) spring means for urging said first ends of said first and second members toward one another, said spring means including a spring member having a first end for pressing the cable against said second end of said first member and having a second end for pressing against said second end of said second member.

4,514,034

METHOD FOR MANUFACTURING A WAVEGUIDE SWITCH INCLUDING THE FORMATION OF BEADS OR CRIMPS TO ALIGN A PAIR OF OPTICAL FIBERS

Helmut Bruch, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

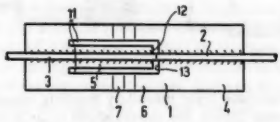
Filed Sep. 9, 1982, Ser. No. 416,332

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138709

Int. Cl.³ G02B *7/26, 5/14*

U.S. Cl. 350—96.20 **1 Claim**

1. A method for manufacturing a switch for opening and closing an optical connection between two end faces of a pair of first and second fiber-optical waveguides wherein the first waveguide is a stationary waveguide that is attached to a carrier part which is rigidly fixed in the switch and the second waveguide is a movable waveguide that is attached to a flexible switch tongue with an end face of the waveguide being spaced a predetermined amount from an end face of the stationary waveguide, said switch having connecting means for interconnecting the switch tongue to the carrier part, the method comprising the steps of providing a single piece having a plurality of slots formed therein to create the tongue having an end being connected to the carrier part by at least one integral stay with the end of the tongue being spaced from one edge of the carrier part; then forming a shallow bead in each stay extending transverse thereto to cause the end of tongue to move toward the one edge of the carrier part; securing the first waveguide on the carrier part with an end face being adjacent



said one edge of said carrier part; securing the second waveguide on the tongue with an end face of the second waveguide being aligned and engaged with the end face of the first waveguide; and then pressing the shallow bead out of each of the integral stays to cause the end of the switch tongue and the end face of the second waveguide to move a predetermined distance away from the one edge of the carrier part and the end face of the first waveguide.

4,514,035

CABLE WITH AN OUTER JACKET OF GNAW RESISTANT MATERIAL

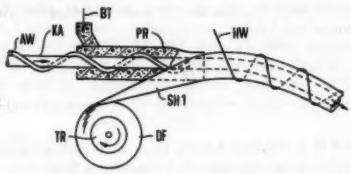
Peter Steinmann, and Norbert Sutor, both of Deisenhofen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,713

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1981, 3139897

Int. Cl.³ G02B *5/16*

U.S. Cl. 350—96.23 **16 Claims**



1. A cable comprising a cable jacket surrounding parts of the cable and means being additionally provided on the outside of the cable jacket to prevent animal gnawing, said means including a layer of resistant, hardenable material, said material only hardening when treated with a hardening agent while installing the cable, said material comprising concrete which is hardened subsequent to the cable installing operation.

4,514,036

CABLE HAVING A LAMINATED PLASTIC INSULATING SHEATH

Neil McDonald, Manchester, England, assignor to Raydex International Limited, Lancashire, England

Continuation of Ser. No. 309,750, Oct. 8, 1981,. This application Aug. 1, 1983, Ser. No. 518,328

Claims priority, application United Kingdom, Oct. 10, 1980, 8032787

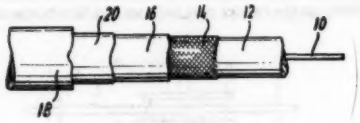
Int. Cl.³ B32B *27/00*; G02B *5/16*; H01B *7/00*

U.S. Cl. 350—96.23 **7 Claims**

1. A cable having conductor means surrounded by an insulating sheath, the exterior of the sheath constituting the exterior of the cable, the sheath consisting essentially of:

a flexible relatively soft inner layer of polyethylene,

a relatively hard abrasion-resistant outer layer of polypropylene having low frictional resistance characteristics, the polypropylene being sufficiently thin so as not to substantially limit the flexibility of the cable, said polypropylene forming the outermost layer of the cable,



an intermediate layer intimitely bonding together the inner and outer layers, the intermediate layer being a homogeneous mixture of said polyethylene and said polypropylene,

said intermediate layer and outer layer being formed by extruding them on to the inner layer.

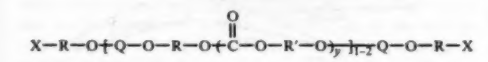
4,514,037

ULTRAVIOLET CURABLE OUTER COATINGS FOR OPTICAL FIBER

Timothy E. Bishop, Arlington Hgts.; Joseph J. Stanton, Buffalo Grove; George Pasternack, Lincolnshire, and Orvid R. Cutler, Jr., Rolling Meadows, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

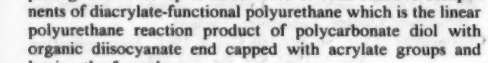
Filed Oct. 21, 1983, Ser. No. 544,010
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.23 **7 Claims**

1. A resin buffer-coated and topcoated optical glass fiber in which the topcoat is an ultraviolet cured coating of an ultraviolet curable coating composition which, when formed into a 3 mil cured test film, has a tensile strength of at least 2500 psi., a tensile modulus measured at room temperature of at least 50,000 psi., and an elongation in excess of about 40%, said composition comprising from 30% up to about 80% of total reactive components of diacrylate-functional polyurethane which is the linear polyurethane reaction product of polycarbonate diol with organic diisocyanate end capped with acrylate groups and having the formula:



in which R is alkylene having from 1–20 carbon atoms; R′ is the residue of an alkylene diol containing from 2–12 carbon atoms; Q is the residue of an organic diisocyanate; X is the residue of acrylic acid; y is at least 1; and R′ and y are selected to provide a molecular weight for the polycarbonate diol reactant of from 300 to 3000, and at least 15% of total reactive components of liquid monoethylenically unsaturated monomer having a glass transition temperature above about 55° C.

5. A method of overcoating resin buffer-coated optical glass fiber in which the topcoat has the high strength and modulus combined with good elongation and water resistance associated with extruded jacket coatings, but which is applied by ordinary coating procedures and cured by exposure to ultraviolet radiation comprising, applying to resin buffer-coated optical glass fiber an ultraviolet-curable coating composition comprising from 30% up to about 80% of total reactive components of diacrylate-functional polyurethane which is the linear polyurethane reaction product of polycarbonate diol with organic diisocyanate end capped with acrylate groups and having the formula:



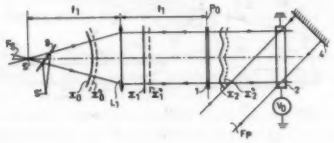
in which R is alkylene having from 1–20 carbon atoms; R′ is the residue of an alkylene diol containing from 2–12 carbon atoms; Q is the residue of an organic diisocyanate; X is the residue of acrylic acid; y is at least 1; and R′ and y are selected to provide a molecular weight for the polycarbonate diol reactant of from 300 to 3000, and at least 15% of total reactive components of liquid monoethylenically unsaturated monomer having a glass transition temperature above about 55° C., and then exposing the wet-coated fiber to ultraviolet light to cure the coating.

4,514,038

OPTICAL FOURIER TRANSFORMER DEVICE AND OPTICAL CORRELATOR INCORPORATING THE SAID DEVICE

Laurence Pichon, and Jean P. Huignard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 2, 1982, Ser. No. 345,018
Claims priority, application France, Feb. 6, 1981, 81 02410
Int. Cl.³ G06G 9/00
U.S. Cl. 350—162.13 **8 Claims**



1. An optical Fourier transformer device comprising:

a convergent lens;

a coherent radiation point source located at the focal distance from said convergent lens for producing a source beam;

means for positioning a modulating object in the collimated beam emerging from said convergent lens, thereby forming a modulated beam;

a photoexcitable interaction medium having an index of variation which receives the modulated beam and which receives a pumping beam,

a plane reflector arranged so as to reflect in normal incidence and towards the said photoexcitable interaction medium the undiffractive radiation emerging from said medium so as to create a diffracted wave emerging from said medium conjugate to said modulated beam, and wherein said convergent lens forms at a Fourier transform plane the Fourier transform of the light incident thereon,

a semi-transparent plate positioned between the said point source and said convergent lens for deflecting toward a Fourier transform plane of said convergent lens the radiation contained in the conjugate wave re-radiated by said medium in the direction of said lens.

4,514,039

LENS MOUNTING

Tohru Kawai, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,077
Claims priority, application Japan, Dec. 25, 1981, 56-209310
Int. Cl.³ G02B 7/02
U.S. Cl. 350—255 **4 Claims**

1. A lens mounting assembly defining an optical axis comprising:

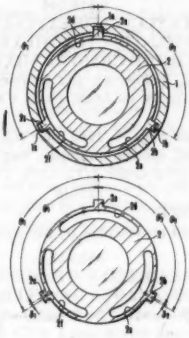
a generally cylindrical support member having an inner surface;

an integrally formed sleeve fitted within said support member for sliding movement relative thereto;

guide means interposed between said sleeve and said inner surface to guide movement of said sleeve relative to said

support member longitudinally along said optical axis, said guide means including guide members projecting radially outwardly from said sleeve for sliding engagement with said support member;

lens support means on said sleeve formed integrally with said guide means for supporting a lens member therein; and



cutout portions on said sleeve between said guide means and said lens support means for imparting resiliency to parts of said sleeve having said guide portions thereon to enable said guide portions to resiliently adjust in position when said sleeve is fitted into said support member.

4,514,040

PRISMATIC REFRACTOR FOR CONCENTRATING SOLAR ENERGY ON A SUITABLE COLLECTING SURFACE, OF FIXED POSITION WITH RESPECT TO TIME

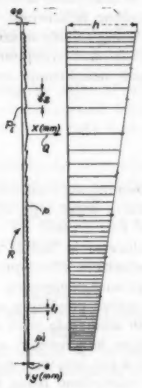
Tazio Pinelli, Pavia, and Francesco Sebastiano, Termoli, both of Italy, assignors to Societa' Italiana Vetro-Siv-S.p.A., San Salvo, Italy

Filed Feb. 23, 1983, Ser. No. 468,994

Claims priority, application Italy, Mar. 11, 1982, 20105 A/82

Int. Cl.³ G02B *5/04, 3/08*

U.S. Cl. 350—286 **4 Claims**



1. A stationary refractor for concentrating solar energy onto a planar collecting region in a concentration ratio of at least 2.6 for a substantial period during the day,

said concentration ratio being the ratio of the width of the refractor to the width of the portion of the collecting region illuminated by the sun during said period,

said width being perpendicular to the length and height of said refractor and said length and height being perpendicular to each other;

said refractor comprising a flat base surface and a serrated top surface,

the serrated top surface comprising a plurality of optical elements as follows:

a central, non-focussing, straight prismatic element and a plurality of adjacent, non-focussing, straight prismatic elements on both sides of said central element, said prismatic elements having two exposed faces,

said central and adjacent prismatic elements having a maximum height of 3 mm., independent of said base,

said refractor having an axis disposed parallel to the length of said straight prismatic elements, said axis dividing said refractor into an upper and a lower portion,

said central prismatic element being disposed on said axis and having both faces thereof intersecting at said axis but said both faces not being perpendicular to said base,

the next adjacent element on either side of said central element having a face perpendicular to said base and in contact with the bottom of a face of said central element and a face which forms a diagonal which intersects said perpendicular face,

the remaining adjacent elements having a face perpendicular to said base and a face intersecting said face perpendicular to said base,

said lower portion and said upper portion containing an unequal number of said prismatic elements, the lower portion having a greater number of said elements than the upper portion, the width of the prismatic elements in the lower portion being equal to or greater than 4 mm. and equal to or greater than 6.5 mm. in the upper portion and the faces which form diagonals on opposite sides of said axis facing each other.

4,514,041

POLARIZER WITH ELECTRODE THEREON IN A LIQUID CRYSTAL DISPLAY

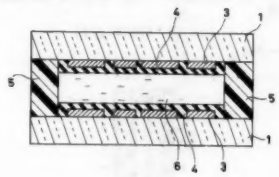
Hironki Tanaka, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 181,962, Aug. 28, 1980, abandoned. This application Jun. 13, 1983, Ser. No. 501,974

Claims priority, application Japan, Aug. 30, 1979, 54-119887[U]

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—337 **2 Claims**



2. A liquid crystal display cell consisting of:

a pair of polarizers each comprising a layer of polyacetylcellulose bonded by a pair of polyvinylalcohol layers each having formed on one surface thereof by low-temperature sputtering a patterned transparent electrode having a maximum resistance ratio of about 300 Ω/cm^2 and a thickness of about 800 Å, at least one of said polarizers having superimposed over said transparent pattern electrode an orientation film, said polarizers being bonded together such that said patterned electrodes face each other in a manner so as to form a cavity therebetween; and

a liquid crystal mixture present between said transparent electrode bearing surfaces of said polarizers within said

cell cavity at least one of said polarizers exhibiting properties of cutting ultraviolet radiation.

4,514,042

THIN STRUCTURE OF DISPLAY PANEL

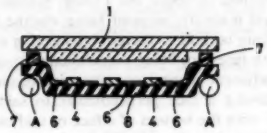
Takashi Nukii; Shigeo Nakabu, both of Nara; Masaru Iwasaki, Izumisano, and Katunobu Awane, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1982, Ser. No. 422,140

Claims priority, application Japan, Sep. 30, 1981, 56-157142; Jun. 30, 1982, 57-114463

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—331 R **7 Claims**



1. A display module comprising:

display means for displaying visual information;

electrode means disposed on said display means;

first circuit board means shaped as a plate for carrying wiring lines connected to a first circuit means for driving said display means said plate comprising a curled flange portion rising above a bottom portion; and

electrically conductive elastomer body means for connecting said wiring lines and said electrode means;

said conductive elastomer body means being placed between said electrode means and said flange portion of said circuit board means and said first circuit means is placed on said bottom portion of said circuit board means.

4,514,043

METHOD FOR THE PREPARATION OF ORIENTATION LAYERS FOR LIQUID CRYSTAL DISPLAYS AND LIQUID CRYSTAL DISPLAYS HAVING ORIENTATION LAYERS

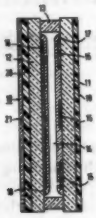
Hellmut Ahne, Röttenbach; Hans Krüger, Munich, and Roland Rubner, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 22, 1982, Ser. No. 350,826

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107520

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—341 **7 Claims**



1. In a method for the preparation of orientation layers for liquid crystal displays wherein a solution of an organic prepolymer is applied to a transparent substrate and the prepolymer then annealed to form the desired polymer which is then subjected to rubbing as an orientation treatment, the improvement comprising utilizing as said prepolymer a prepolymer for a polyisoindoloquinazoline dione or a polyquinazoline dione, which prepolymer does not need to be radiation-sensitive, and which prepolymer produces a volatilizable side product when polymerized during annealing, the amount of said side product volatilized being a high weight percentage relative to the weight of the polymer.

4,514,044

1-(TRANS-4-ALKYLCYCLOHEXYL)-2-(TRANS-4'-(P-SUBSTITUTED PHENYL) CYCLOHEXYL)ETHANE AND LIQUID CRYSTAL MIXTURE

Tomoki Gunjima, Yokohama, and Ryutaro Takei, Tokyo, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

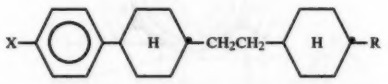
Filed Aug. 16, 1983, Ser. No. 523,607

Claims priority, application Japan, Aug. 27, 1982, 57-147829

Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *23/18, 121/00, 13/28, 25/18*

U.S. Cl. 350—350 R **7 Claims**

1. A compound represented by the general formula:



where X is a halogen atom, an alkyl group having from 1 to 8 carbon atoms or a cyano group, and R is an alkyl group having from 1 to 8 carbon atoms.

4,514,045

HELICHROMIC-SMECTIC LIQUID CRYSTAL COMPOSITIONS AND DISPLAY CELLS

William A. Huffman, Minneapolis, and Harvey A. Brown, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 274,184, Jun. 22, 1981, Pat. No. 4,394,070, which is a continuation-in-part of Ser. No. 169,275, Jul. 16, 1980, abandoned. This application Oct. 22, 1982, Ser. No. 436,030

Int. Cl.³ C09K *3/34*; G02F *1/13*

U.S. Cl. 350—351 **26 Claims**

1. A composition consisting essentially of a smectic liquid crystal material, and, in admixture therewith, an organic, nonionic, nonliquid-crystalline helichromic compound, said helichromic compound being soluble in said smectic liquid crystal material, said helichromic compound being a circularly dichroic dye, and said helichromic compound having the general formula

$$Q{-}Z)_n$$

wherein

Q is an organic group having a chromophoric character;

Z is an optically-active organic group; and n is an integer having a value of 1 or greater.

16. A thermally addressable liquid crystal display device having no auxiliary polarizers, which provides a high contrast image against a background comprising:

a layer of a composition consisting essentially of a liquid crystal medium in admixture with an organic, nonionic, nonliquid-crystalline helichromic compound, said layer disposed between a top substrate and a bottom substrate, said helichromic compound being soluble in said liquid crystal medium, said helichromic compound being a circularly dichroic dye, and said helichromic compound having the general formula

$$Q(Z)_n$$

wherein

Q is an organic group having a chromophoric character;

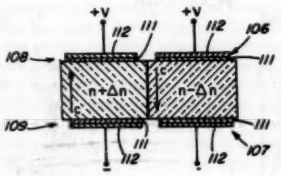
Z is an optically-active organic group; and
n is an integer having a value of 1 or greater;
said liquid crystal medium being thermally sensitive and having a transition between at least two thermal phases, an upper phase being a nematic phase and a lower thermal phase being a smectic phase, said mixture having two possible states of orientation in said smectic phase, a first orientation state being substantially light absorbing and a second state being substantially light transmissive;
a means of affecting a thermal transition between said lower thermal phase and said upper thermal phase; and
a means of electrically addressing portions of said mixture to develop said second light transmissive state when said mixture passes rapidly into said lower thermal state from said upper thermal state, the remaining unaddressed portions of said mixture developing said first substantially light absorbing state when said mixture passes rapidly into said lower thermal state from said upper thermal state.

4,514,046

POLARIZATION-INSENSITIVE OPTICAL SWITCH AND MULTIPLEXING APPARATUS

W. John Carlsen, Boston, and Paul Melman, Newton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 327,873, Dec. 7, 1981,. This application Dec. 16, 1983, Ser. No. 562,327
Int. Cl.³ G02F *1/03*
U.S. Cl. 350—385 **5 Claims**



1. In combination,
a first electro-optical crystal,
a second electro-optical crystal,
a dielectric beam splitting coating affixed to portions of said crystals with coated portions of such crystals being juxtaposed,
first means for varying the index of refraction of one beam path through one of said crystals with respect to the index of refraction of one beam path through the other of said crystals, and
second means for varying the index of refraction of another beam path through said one of said crystals with respect to the index of refraction of another beam path through said other of said crystals, said second means being independent from said first means.

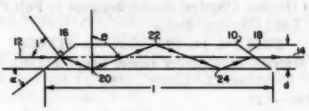
4,514,047

ON-AXIS ACHROMATIC QUARTERWAVE RETARDER PRISM

Haim M. Haskal, and Robert A. Briones, both of Colorado Springs, Colo., assignors to Magnetic Peripherals Inc., Bloomington, Minn.

Filed Oct. 12, 1982, Ser. No. 433,933
Int. Cl.³ G02F *1/00*
U.S. Cl. 350—394 **2 Claims**

1. A quarterwave retarder prism for polarized light having an emerging light beam optical axis collinear with the entering light beam optical axis and prism faces for the entering and emerging light beams inclined with respect to the light beams and using three internal reflections to obtain a quarterwave retardation and for which the prism angle α is chosen according to the following formula:



$$\tan\frac{\delta}{2} = \frac{\cos\theta\sqrt{\sin^2\theta - n^{-2}}}{\sin^2\theta}$$

FOR $\delta = \frac{\pi}{q}$

$$\sin^2\theta = \frac{1+n^{-2}\pm\sqrt{(1+n^{-2})^2 - 4(n\cos\frac{\pi}{q})^{-2}}}{2(\cos\frac{\pi}{q})^{-2}}$$

$$\alpha + \sin^{-1}\left(\frac{\cos\alpha}{n(\lambda_0)}\right) - \theta(\lambda_0) = 0$$

$\lambda = \lambda_0$, THE DESIGN WAVELENGTH

$$\frac{1}{q} = 3\tan\theta + (\tan\alpha)^{-1}$$

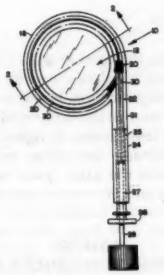
$$\alpha + \sin^{-1}\left(\frac{\cos\alpha}{\eta(\lambda_0)}\right) - \theta(\lambda_0) = 0$$

4,514,048

VARIABLE FOCUS ELASTOMERIC LENS SYSTEM

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 17, 1981, Ser. No. 293,230
Int. Cl.³ G02B *3/10, 15/00*; G02C *7/08*
U.S. Cl. 350—423 **11 Claims**



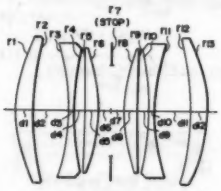
1. A variable focus lens system comprising:
a single lens element formed of at least one transparent, homogeneous, solid, elastomeric material selectively shaped to provide said lens element with a predetermined optical power when said lens element is in a relaxed state; and
means for supporting said lens element about its peripheral edges while in said relaxed state and for exerting a continuously variable tensile stress directly to and substantially uniformly distributed around the peripheral edges of said lens element to alter the relaxed shape of said lens element in a predetermined manner so that said optical power of said lens element can be changed in a continuous manner over a predetermined range.

4,514,049

ZOOM LENS SYSTEM FOR FINITE CONJUGATE DISTANCES

Nagayoshi Hirano, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Ohmiya, Japan

Filed Jul. 14, 1983, Ser. No. 513,684
Claims priority, application Japan, Sep. 30, 1982, 57-172095
Int. Cl.³ G02B *15/16, 17/00*
U.S. Cl. 350—425 **2 Claims**



1. A zoom lens system for finite conjugate distances comprising first to sixth elements arranged in this order from front to rear with a stop disposed between the third and fourth elements, the first element being a positive lens convex to the front, the second element being a negative lens concave to the front, the first and second elements together forming a first stationary lens group having negative power, the third element being a positive lens forming a first movable lens, the sixth, fifth and fourth elements being reverse duplicates of the first, second and third elements, the fourth element forming a second movable lens, the fifth and sixth elements together forming a second stationary lens group, said zoom lens system being axially movable as a unit, and the first and second movable lenses being axially movable in response to the axial movement of the entire lens system to vary the magnification of the image without changing the distance between the object plane and the image plane, wherein the following conditions are satisfied,

$$0.4<fV/f_{1.0}<0.61$$

$$-0.55<fV/r_5=fV/-r_9<0.3$$

$$0.72<d_9/d_4<1.39$$

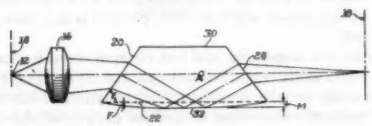
wherein fV represents the focal length of the movable lenses, $f_{1.0}$ represents the focal length of the entire lens system when it is adjusted for unit magnification, r_5 and r_9 respectively represent the radii of curvature of the surfaces of the movable lenses facing the stationary lens groups, d_9 represents the axial space between the first stationary lens group and the first movable lens, and d_4 represents the axial space between the second stationary lens group and the second movable lens.

4,514,050

DOVE PRISM FOR CONVERGENT LIGHT PATHS

David G. Stites, Elgin, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 22, 1982, Ser. No. 400,810
Int. Cl.³ G02B *5/04, 17/00*
U.S. Cl. 350—444 **7 Claims**



1. Apparatus for correcting chromatic and astigmatic aberrations in prisms in convergent light paths comprising:

a transparent entrance face permitting converging imaging rays to enter the prism;

a transparent exit face permitting the converging imagining rays to exit the prism;

a third face connecting the entrance and exit faces and reflecting substantially all of the imaging rays received from the entrance face internally into the prism and towards the exit face;

the third face disposed at an acute angle with respect to both the entrance and exit faces, with the angle between the third face and the entrance face different than the angle between the third face and the exit face, the angles selected to create a compensating chromatic aberration to compensate for chromatic abberrations caused by the prism when used in convergent light paths and the compensating chromatic aberration is a chromatic spectrum of the proper magnitude and sign to substantially compensate for lateral chromatic aberrations of the prism,

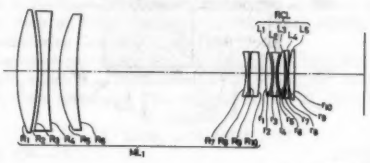
the third face further having a spherical, convex curvature which produces a compensating astigmatic aberration to compensate for the astigmatic aberration caused by the entrance and exit faces acting on the converging imaging rays.

4,514,051

REAR CONVERSION LENS

Yoshinari Hamanishi, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 422,950, Sep. 24, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 641,361
Claims priority, application Japan, Jan. 20, 1982, 57-6079
Int. Cl.³ G02B *13/02*
U.S. Cl. 350—465 **11 Claims**



1. A rear conversion lens for a single lens reflex camera capable of maintaining excellent image forming performance, even if it is mounted on an objective lens having a relatively short back focus, a large aperture ratio, and an exit pupil which is at a relatively distant position from the image plane, comprising:

a front lens unit including, in the sequence from the object side, a positive lens, a negative biconcave lens and a positive lens; and

a rear lens unit including a negative lens with its surface of sharper curvature facing the object side, and further satisfying the following conditions:

$$0.1 < \frac{\Sigma_d}{-f_R} < 0.2$$

$$0.95 < \frac{B_f}{-d_0} < 1.2$$

$$n_{-} > 1.82$$

$$\nu_{-} > 35$$

where, Σ_d denotes the distance between the frontmost surface and the rearmost surface of said rear conversion lens; f_R represents the focal length of said rear conversion lens; B_f is the back focus when said rear conversion lens is mounted on the objective lens; d_0 designates the distance between the frontmost surface of said rear conversion lens

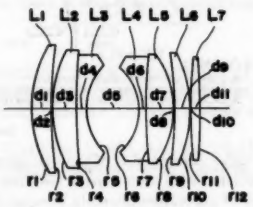
and the rear focal point of said objective lens; n_- denotes the refractive index of the negative lens which has the highest refractive index in said rear conversion lens; and ν_- represents the Abbe number of the negative lens which has the lowest Abbe number in the rear conversion lens.

4,514,052

HIGH SPEED OBJECTIVE LENS SYSTEM WITH AN ASPHERIC SURFACE

Tamikazu Yamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1982, Ser. No. 446,653
Claims priority, application Japan, Dec. 7, 1981, 56-197239
Int. Cl.³ G02B 9/60
U.S. Cl. 350—466 **8 Claims**



1. A high speed objective lens system with an aspheric surface comprising, from the object to image side:

a front lens group consisting of a first positive lens, a second positive lens and a third negative lens; and

a rear lens group consisting of a fourth negative lens, a fifth positive lens cemented to the fourth negative lens, a sixth positive meniscus lens and a seventh biconvex lens, wherein the second positive lens has an aspheric surface at its object side, which increases the deviation from its paraxial radius to the object side in accordance with the increase of the height from the optical axis, the d-line modulation transfer function being substantially 1.0 for a resolution of 0 to 20 lines/millimeter when the lens system fulfills the following conditions:

$$0.65 < Da/db < 1.1$$

$$B < 0$$

$$C < 0$$

wherein:

Da represents the sum of axial distance from the object side surface of the second positive lens to the image side surface of the third negative lens;

Db represents the sum of axial distance from the object side surface of the fourth negative lens to the image side surface of the fifth positive lens;

B and C represent the aspheric surface coefficients, respectively, in the following equation provided that X represents the distance, measured toward the image side along the direction parallel with the optical axis, from the center of the aspheric surface to a point on the aspheric surface at the height, Y from the optical axis, and r_0 represents the paraxial radius of curvature of the aspheric surface:

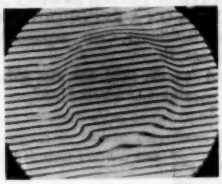
$$X = \frac{Y^2}{r_0 + r_0\sqrt{1 - \left(\frac{Y}{r_0}\right)^2}} + AY^2 + BY^4 + CY^6 + DY^8 + \ldots .$$

4,514,053

INTEGRAL PHOTOSENSITIVE OPTICAL DEVICE AND METHOD

Nicholas F. Borrelli, Elmira; David L. Morse, and Paul A. Sachenik, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,178
Int. Cl.³ G02B 5/18, 3/00
U.S. Cl. 350—162.2 **11 Claims**



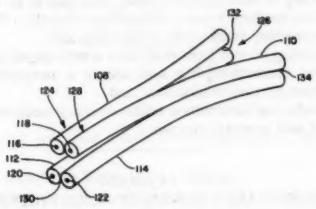
1. An integral optical device composed of a body of photosensitive glass having an optical pattern developed therein by a spatially varying property due to formation of colloidal metal particles and/or a crystalline microphase nucleated by such particles.

4,514,054

QUADRATURE FIBER-OPTIC INTERFEROMETER MATRIX

David W. Stowe, Buffalo Grove, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 340,672, Jan. 19, 1982, Pat. No. 4,418,981. This application Jun. 28, 1983, Ser. No. 508,762
Int. Cl.³ G02B 5/172; G01B 9/02
U.S. Cl. 350—96.15 **8 Claims**



1. A fiber optic interferometer for monitoring phase modulation of a modulated light signal with respect to a reference light signal, comprising:

first, second, third, and fourth optical fibers (**108, 110, 112, 114**) each having a central axis (**116, 118, 120, 122**) and each having longitudinally extending portions of substantially equal lengths with respect to one another, each portion having a light-entrance end (**124**) and a light-exit end (**126**), said first fiber (**108**) receiving said modulated light at its light-entrance end (**124**), said third fiber (**112**) receiving said reference light signal at its light-entrance end (**124**), said first and second fibers (**108, 110**) being coupled to one another toward said light-entrance end (**124**) to allow said modulated signal to be coupled into said second fiber (**110**), said third fiber (**112**) being coupled to said fourth fiber (**114**) toward said entrance end (**124**) to allow said reference signal to be coupled into said fourth fiber (**114**), said first and third fibers (**108, 112**) being coupled together toward said exit end (**126**), and said second and fourth fibers (**110, 114**) being coupled together

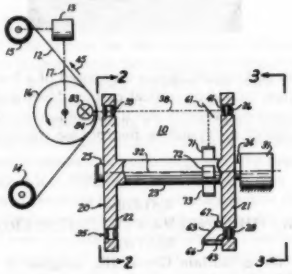
toward said exit end (126) to allow said modulated signal in said first and second fibers (108, 110) to be coupled with said reference signal in said third and fourth fibers (112, 114) respectively, said first, second, third, and fourth fibers (108, 110, 112, 114) being situated in generally parallel juxtaposition with one another along said longitudinally extending portions so said central axis (116, 118, 120, 122) of each fiber defines the corners of a rectangle in a plane perpendicular to said longitudinally extending portions.

4,514,055

INFORMATION TRANSFERRING SYSTEMS OPERATING ON A RECORDING MEDIUM

Frederic F. Grant, Bellflower, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 20, 1983, Ser. No. 459,441
Int. Cl.³ G02B 27/17
U.S. Cl. 350—6.3 **32 Claims**



1. In a method of transferring information relative to a recording medium, the improvement comprising in combination the steps of:

bending said medium about a first axis;

moving an information transfer stimulus in an arc over said bent medium about a second axis laterally offset from and extending at an angle to said first axis;

imparting to said bent medium a wave-shaped configuration for accommodating said arc in a perpendicular plane through said second axis; and

transferring information relative to said medium with the aid of said moving stimulus.

4,514,056

ACOUSTICALLY TUNED OPTICAL FILTER SYSTEM

Victor Azgapetian, deceased, late of Costa Mesa, Calif. (by Alice M. Azgapetian, executrix), assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1982, Ser. No. 439,493
Int. Cl.³ G02F 1/11
U.S. Cl. 350—372 **3 Claims**

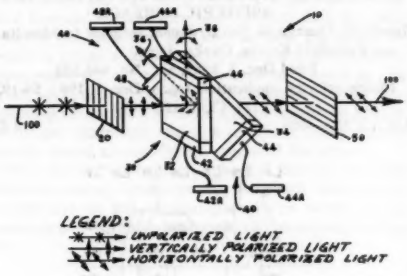
1. An acoustically tuned optical filter system for use with electromagnetic radiation in the visible/infrared light wavelength region, said optical filter system comprising:

a. a polarizer in optical alignment with said radiation, whereby said radiation impinges upon and is transmitted by said polarizer as polarized light;

b. an acoustically tuned optical filter assembly disposed in optical alignment with said polarizer, wherein this assembly includes:

(1) a plurality of rotatable crystals made of acousto-optical material, with each crystal of said plurality being in parallel spaced relationship with its adjacent crystal, and with each crystal having its front surface and its extraordinary axis in perpendicular relationship to said transmitted radiation, whereby said crystals can be rotated such that said extraordinary axes of said crystals can be selectively rotated angularly, and thereby variably, with respect to each other, and wherein each crystal of said plurality of crystals has two mutually opposed side edges; and

(2) means, operably associated with said plurality of crystals, for acoustically exciting each of said plurality of crystals, said means for acoustically exciting each crystal includes a different pair of acoustic generators operably associated with each crystal, with one generator of said pair of generators operably associated with one of said two edges of its crystal, and with the other generator of said pair of generators operably associated with the other edge of said two edges of its crystal; and



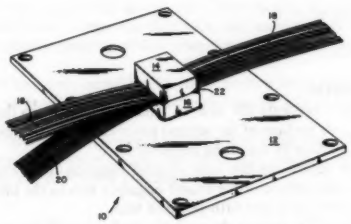
c. an analyzer in optical alignment with said acoustically tuned optical filter assembly.

4,514,057

FIBER OPTIC COUPLER ARRAY AND FABRICATION METHOD

John P. Palmer, Pomona, and Phillip B. Ward, Jr., Brea, both of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Dec. 23, 1981, Ser. No. 333,955
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.15 **28 Claims**



1. Apparatus providing a plurality of substantially identical optical fiber couplers in an integral assembly comprising:

a first sub-assembly including a first support block having an arcuate surface with a plurality of equally spaced grooves aligned in a circumferential direction across the arcuate surface and a plurality of first optical fibers positioned individually in corresponding ones of said grooves;

a second sub-assembly including a second support block having an arcuate surface with a plurality of equally spaced grooves aligned in a circumferential direction across the arcuate surface and a plurality of second optical fibers positioned individually in corresponding ones of said grooves;

portions of epoxy resin applied to each of said arcuate surfaces to at least partially encase the respective optical fibers positioned in said grooves;

the respective portions of epoxy and encased optical fibers being lapped to predetermined depths to develop opposed, mating, optically flat planar surfaces with the optical fibers being lapped to expose at least portions of the cores of the optical fibers along said planar surfaces, the exposed portions of corresponding fibers in the respective sub-assemblies being aligned to establish a plurality of individual couplers effective to couple light between fibers of one of said sub-assemblies and corresponding fibers of the other sub-assembly;

the fibers of said second sub-assembly being smaller in diameter than the fibers of the first sub-assembly and being lapped to a depth sufficient to sever said fibers; and

means for affixing said sub-assemblies together with the respective fibers in said aligned relationship.

4,514,058

TRANSMISSION CABLE WITH HELICAL SUPPORT ELEMENTS OF CURVILINEAR PROFILE

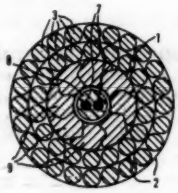
John M. Walton, Doncaster, England, assignor to Bridon Limited, England

Filed Mar. 5, 1982, Ser. No. 355,155

Claims priority, application United Kingdom, Mar. 6, 1981, 8107035

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.23 **4 Claims**



1. In a strain cable comprising a core which includes at least one transmission element; a structure which includes a tubular layer of interlocking metallic support members which are helically spun so as to form a single central passage accommodating the core; and at least one layer of metallic load-carrying elements helically spun around the structure, the improvement wherein the interlocking support members are wires of curvilinear profile having a helical pitch of 10° to 30° , the interlocking wires being at most twelve in number and the width, radial height and cross-sectional shape of the wires being such that the structure formed by the wires is radially and longitudinally self-supporting and sufficiently strong to resist reduction of the cross-section of the central passage when tension is applied to the cable in normal use and to protect the core against transverse stress.

4,514,059

INCOHERENT OPTICAL HETERODYNE FOURIER TRANSFORMER

Michael M. McDonnell, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 15, 1982, Ser. No. 418,318

Int. Cl.³ G06G *9/00*; G02B *5/18*

U.S. Cl. 350—162.16 **13 Claims**

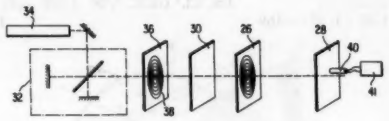
1. A method for performing a Fourier transform of a transparent image, comprising:

providing a first zone plate comprising alternating transparent and opaque zones;

providing a second zone plate comprising alternating transparent and opaque zones;

positioning the image between said first and second zone plates;

passing incoherent light through said first zone plate, the image, and said second zone plate;



phase modulating said first zone plate at a known rate;

detecting the output from said second zone plate and generating a signal representative of the output; and

filtering said signal to isolate therefrom signals of a frequency equal to said known rate.

4,514,060

EXTERNAL REAR VIEW MIRROR FOR MOTOR VEHICLES WHICH FOLDS

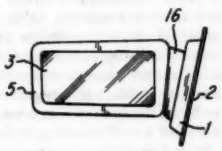
Bernhard Mittelhäuser, No. 57, 3002 Wedemark 2, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,167

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107988

Int. Cl.³ B60R *1/06*

U.S. Cl. 350—632 **11 Claims**



1. An external rear view mirror for motor vehicles, comprising:

a base adapted to be fastened to a vehicle;

a housing for receiving a mirror body, said housing being pivotably mounted to said base in such a way that a gap formation exists during tilting between said base and said housing when an impact has been exerted upon said housing in a particular direction including a tilting occurrence during an accident; and

a relatively flat seal which is adapted to span said gap formation during tilting between said base and said housing, said seal having a first edge directed toward said base, and a second edge directed toward said housing, with one of said base and said housing being provided with at least one groove in the vicinity of said seal; with one of said first and second edges of said seal being securely fixed at only one of said edges relative to one of said base and said housing, and with the other of said first and second edges of said seal being readily releasably engageable with a positive connection in, and also being readily capable of being lifted away from, said at least one groove whereby the mirror folds into different positions dependent upon occurrence of tilting between said base and said housing to make sure that a sealing effect exists even though a gap formation occurs when a tilting has arisen.

4,514,061

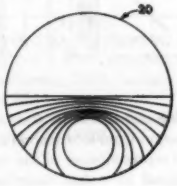
PROGRESSIVE POWER OPHTHALMIC LENSES

John T. Winthrop, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 246,139, Apr. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 232,755, Feb. 9, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 543,223

Int. Cl.³ G02C *7/06*

U.S. Cl. 351—169 **10 Claims**



1. In a progressive power ophthalmic lens having two refractive surfaces one of which is divided into three viewing zones comprising an upper distance portion, an intermediate progressive portion and a lower near portion, and having a principal vertical meridian defined by a sequence of points traversing said zones, wherein said distance portion occupies approximately the upper half of said lens and is of substantially spherical configuration providing a substantially constant focal length for distant vision, wherein said near portion occupies a lower portion of said lens and is of substantially spherical configuration providing a substantially constant focal length for near vision, and wherein said intermediate progressive portion lies between and has defined boundaries with said distance and near portions and has a varying curvature which increases continuously and progressively along said meridian from a minimum value, which approximates the curvature of said distance portion, to a maximum value, which approximates the curvature of said near portion, the improvement wherein said intermediate progressive portion is defined by a series of generating curves passing successively through all points of the meridian within said progressive portion, said generating curves being the lines of intersection of an ordered sequence of spheres and a corresponding ordered sequence of cylinders, said spheres being tangent to points on the meridian and having radii equal to the radius of curvature of the meridian at each point, and said cylinders having generating lines parallel to a line normal to the center point of said lens, the generating curves being so constructed and arranged that aberrations are distributed uniformly around said near portion with at least approximate preservation of orthoscopy.

4,514,062

INSTRUMENT FOR INDIRECT OPHTHALMOSCOPY AND ELECTRICAL ENERGY PRODUCING MEANS THEREFOR

James L. Fitzgerald, 20 Mason St., Williamstown, Mass. 01267

Filed Apr. 8, 1982, Ser. No. 366,698

Int. Cl.³ A61B *3/10*

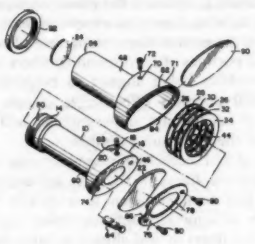
U.S. Cl. 351—205 **23 Claims**

1. In an ophthalmoscope for observing the fundus of an eye including a casing having an image receiving aperture and an image viewing aperture, illuminating means including a light source for providing a light beam for illuminating the fundus and lens means for viewing the illuminated fundus, the improvement comprising electrical energy producing means for providing electrical energy to said light source, said electrical energy producing means comprising a substantially annular battery, said battery including:

(a) first and second substantially annular contact members; and

(b) a plurality of battery cells arranged in spaced relation and disposed between and electrically connected to said contact members,

said electrical energy producing means adapted to be removably supported on said casing and extending substantially



completely around and substantially conforming to the outer surface of a section of said casing and means electrically connecting said light source and said electrical energy producing means.

4,514,063

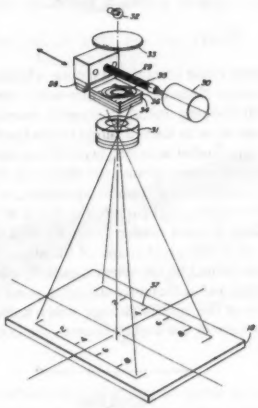
SCANNER DOCUMENT POSITIONING DEVICE

An Wang, Lincoln, and Burton G. McConchie, Reading, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Apr. 28, 1983, Ser. No. 489,642

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—28 **19 Claims**



1. A document positioning device used to locate a document so that desired material thereon may be scanned without further repositioning of the document, said document positioning device comprising:

means for scanning said document, and

means for projecting an image onto said document, said projected image defining the area on said document that will subsequently be scanned by said scanner and the portion of said document that is desired to be scanned is placed in said area.

4,514,064
ELECTROMAGNETIC SHUTTER

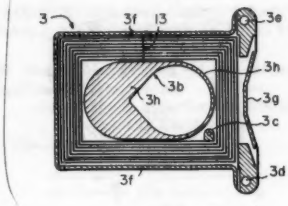
Tomio Kurosu, Iwatsuki, and Yukio Yoshikawa, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,617

Claims priority, application Japan, Nov. 4, 1981, 56-163696[U]; Nov. 10, 1981, 56-166618[U]; Nov. 10, 1981, 56-166619[U]

Int. Cl.³ G03B 9/14

U.S. Cl. 354—234.1 20 Claims



1. In an electromagnetic shutter having an exposure aperture for passing light;

a plurality of shutter sectors made of a plastic material and adapted to be opened from closed positions preventing light from passing through said aperture so that said aperture is uncovered to allow light to pass through said aperture and closed to said closed positions so as to complete an exposure by said shutter;

printed electric coil means operatively coupled with said shutter sectors;

permanent magnet means fixed in said shutter so as to cooperate with said printed electric coil means so that, when electric current is supplied in a predetermined direction to said printed electric coil means for a predetermined time period, an electromagnetic force is generated by said printed electric coil means by virtue of the cooperation thereof with said permanent magnet means to cause said shutter sectors to be opened for said predetermined time period and thereafter closed to complete a required exposure;

a mechanically relatively sliding portion movable with each said shutter sectors;

a wear-resisting layer made of the same material as that of said printed electric coil means simultaneously formed on said portion as said printed electric coil means;

a pair of said shutter sectors having substantially the same configuration and adapted to be moved symmetrically oppositely with respect to said aperture along a straight line passing through the center of said aperture and each formed with a light receiving window for passing therethrough the light when at least a portion of said window is brought in alignment with said aperture;

said printed electric coil means being formed on at least a surface of each of said shutter sectors and said wear-resisting layer being formed on the peripheral edge portion on both surfaces of each of said shutter sectors simultaneously with the formation of said printed electric coil means;

each of said shutter sectors being provided with a light intercepting layer of the same material as that of said printed electric coil means adjacent to said window on the surface of said shutter sector; and

said light intercepting layer being formed simutaneously with the formation of said printed electric coil means and said wear-resisting layers by one and the same forming process and being of such a configuration that the same positively interrupt the light from passing through said aperture when said light intercepting layer is in alignment with said aperture.

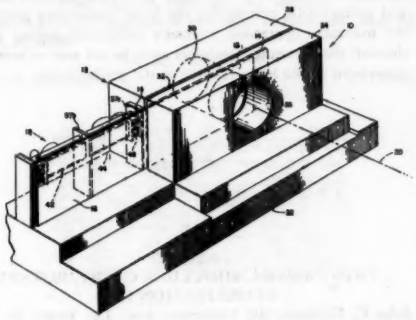
4,514,065
THIN BLADE MEMBERS HAVING MAGNETIC REPELLING FORCES THEREBETWEEN

Jacinto P. Carrera, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 19, 1982, Ser. No. 399,754

Int. Cl.³ G03B 9/14

U.S. Cl. 354—235.1 14 Claims



14. A blade mechanism comprising at least a pair of blade members, means for mounting said blade members for movement along a given path with one planar surface of each of said blade members in facing relations to the other, drive means for advancing said blade members relative each other along said given path, and permanent magnetic means on said blades for providing repelling magnetic fields at the facing surfaces of said blade members to reduce the frictional engagement therebetween.

4,514,066
MECHANISM FOR INDICATING AND SETTING THE PARAMETERS OF EXPOSURE APERTURE AND/OR EXPOSURE TIME FOR PHOTOGRAPHIC CAMERAS

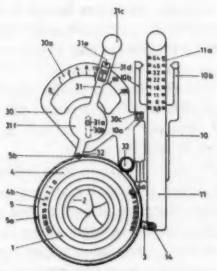
Franz Starp, Mittlere Steige 36, 7547 Wildbad 5, and Werner Deisenroth, Böcklinstrasse 1, 8000 München 19, both of Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,311

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209919

Int. Cl.³ G03B 9/02

U.S. Cl. 354—273 20 Claims



1. Photographic exposure parameter indicating and setting mechanism for a photographic camera lens shutter housing having a manually operatable exposure parameter setting device, which comprises carrier means adapted to be mounted on such lens shutter housing, a guide plate mounted on and carried by the carrier means and having a photographic exposure parameter setting plate scale operatively arranged thereon, and

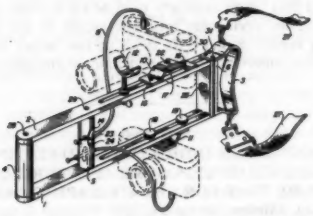
a cooperating pointer lever pivotally and relatively movably guidedly mounted on the guide plate and having a pointer portion arranged for pointing to the scale in any position of movement of the lever relative to the guide plate along the extent of the scale and a lever connecting portion adapted to be articulatedly connected to the manually operatable exposure parameter setting device of the lens shutter housing, whereby upon mounting the carrier means on the lens shutter housing and articulatedly connecting the lever connecting portion to the manually operatable exposure parameter setting device thereof, the exposure parameter may be set and indicated by movement of the lever relative to the guide plate.

4,514,067

TWIN CAMERA, SHOULDER CARRY, ROTARY, STABILIZATION POD

John C. Gallegos, 602 University Ave., Las Vegas, N. Mex. 87701

Filed Feb. 14, 1983, Ser. No. 443,585
Int. Cl.³ G03B *17/00*
U.S. Cl. 354—293 **14 Claims**



1. A shoulder mounted apparatus for supporting a plurality of cameras in a manner that enables each camera to be sequentially brought into operative, upright position;

said apparatus comprises a main frame and a shoulder piece; said main frame includes spaced members having opposed parallel surfaces, said members have a far end opposed to a near end; said members being held together in fixed relationship by at least one handle which is affixed at the far end of said members and a back plate which is affixed at the near end of said members;

a shoulder piece having a shoulder receiving side made into a configuration which generally conforms to one's shoulder, said shoulder piece includes an opposed side for attachment to said back plate;

swivel means located along a longitudinal axis of said main frame by which said back plate and said opposed side of the shoulder piece are affixed to one another so that said main frame can be rotated along the longitudinal axis thereof respective to said shoulder piece;

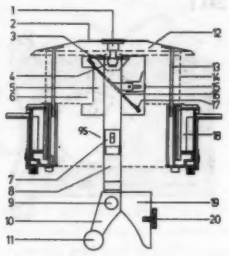
said spaced members have confronting sides which are held in fixed spaced relationship by said handle and said back plate; means formed on said opposed surfaces for releasably attaching a camera thereto so that a camera attached to one opposed surface is opposed to a camera attached to the other opposed surface; so that said shoulder piece can be brought to bear against one's shoulder while said main frame can be rotated respective to said shoulder piece and thereby sequentially bring a camera mounted on the opposed parallel surfaces into operative position.

4,514,068

CAMERA MOUNTING SYSTEM

Kevin G. Urquhart, 22 Flood St., Barraba, New South Wales, 2347, Australia

Filed Aug. 5, 1983, Ser. No. 520,814
Claims priority, application Australia, Aug. 18, 1982, PF5447
Int. Cl.³ G03B *17/56, 29/00*
U.S. Cl. 354—293 **10 Claims**



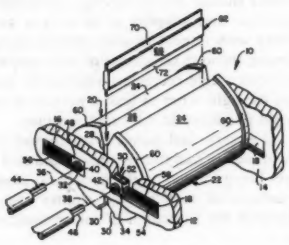
1. A camera mounting system comprising frame support means adapted to be affixed adjacent an opening in the roof of a vehicle or the like; a mounting assembly receivable in said opening and supported by said frame support means, said assembly having a telescoping cap portion extendable from a retracted position wherein the cap portion covers said opening to an extended position outwardly of said opening; a camera mount bracket releasably attachable to said cap portion from within said mounting assembly, said camera mount bracket comprising a mirror adjusted to reflect light from outside said opening to a camera positioned inside on said camera mount bracket, said camera mount bracket being rotatable within said opening.

4,514,069

PHOTOGRAPHIC SHEET PROCESSOR HAVING LARGE DIAMETER ROLLING SURFACES

Gordon F. Kinsman, Billerica; Ronald F. Lambert, Wayland, and David A. Morrison, Framingham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,332
Int. Cl.³ G03B *9/02*
U.S. Cl. 354—304 **14 Claims**



1. A processor for advancing a predetermined quantity of processing fluid as a uniform layer over mutually facing surfaces between a pair of juxtaposed photographic sheets, said processor comprising:

a pair of calendering members, each having a calendering surface defined by a cylindrical sector and having a circumference approximating the length of the sheets;

means for supporting said calendering members rotatably about spaced parallel axes so that the respective calendering surfaces of said members define a processing gap; and

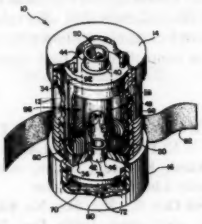
means for rotating said members to advance the sheets through said processing gap.

4,514,070

FILM ASSEMBLAGE INCLUDING A CANNISTER FOR HOUSING A FILM CASSETTE DURING PROCESSING OF FILM

Philip R. Norris, No. Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1984, Ser. No. 606,204
Int. Cl.³ G03D *13/04*
U.S. Cl. 354—313 **10 Claims**



1. A photographic film assemblage for use with commercially available, compact, still picture cameras of the type having means for operably locating a film cassette containing a single roll of film in a position in which the film is adapted to be progressively withdrawn from the film cassette and exposed prior to being rewound into the film cassette, said film assemblage comprising:

a cannister having means for defining a first chamber for housing a film cassette containing a roll of film, means for defining a second chamber for containing a supply of processing fluid, means connecting said first and second chambers, and means for temporarily blocking the movement of processing fluid from said second chamber via said connecting means;

a supply of processing fluid located within said second chamber;

a film cassette for housing a roll of self-developing type film, said film cassette including means defining a lighttight opening through which the film is adapted to be moved to the exterior of said film cassette for exposure thereof;

a length of self-developing type film coiled within said film cassette, said film including a first end attached to a support member located within said film cassette and a second opposite end which is adapted to extend through said lighttight opening for subsequent attachment to a film take-up member of a camera;

a support member rotatably supported within said film cassette said support member cooperating with an interior surface of said film cassette to define a third chamber for accommodating said film, said support member including means for directing a flow of said processing fluid from said connecting means to said third chamber when said film cassette is located within said first chamber of said cannister, and

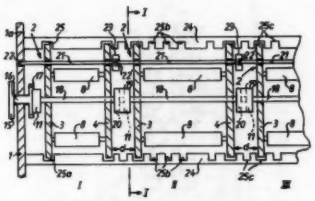
means for rendering said blocking means inoperable thereby permitting the flow of said processing fluid from said first chamber to said third chamber where it will initiate the formation of visible images in any photographically exposed film contained therein.

4,514,071

DEVICE FOR COUPLING THE SHAFTS OF TRANSPORTING UNITS IN DEVELOPING MACHINES OR THE LIKE

Horst Köninger, Munich; Klaus Lehnert, Unterhaching, and Günter Schirk, Munich, all of Fed. Rep. of Germany, assignors to AGFA Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,448
Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220236
Int. Cl.³ G03B *3/08*
U.S. Cl. 354—320 **20 Claims**



1. A coupling device for use in developing machines for photosensitive material, comprising at least substantially coaxial first and second shafts; first and second gears provided on the respective shafts, said first shaft including a portion extending beyond said first gear and toward said second shaft; a sleeve having an internal gear meshing with said first gear and being movable between first and second positions in which said internal gear respectively meshes with and is out of mesh with said second gear; and means for releasably holding said sleeve in said first position, said holding means including male and female detent elements, one of said elements being provided in said sleeve and the other of said elements being provided on said portion of said first shaft, said male and female detent elements being in engagement with one another in the first position of said sleeve.

4,514,072

X-RAY FILM HOLDER APPARATUS

Arthur B. Buckley, 1506 Maple Ave., Northbrook, Ill. 60062

Filed Oct. 18, 1983, Ser. No. 543,043
Int. Cl.³ B08B *3/08;* **G03D** *13/08*
U.S. Cl. 354—337 **12 Claims**

1. An improved X-Ray film holder apparatus for restrainably maintaining a plurality of substantially bowed X-Ray films in position within conventional developing tank insert trays, said apparatus comprising:

substantially flat holder fixture means having upper and lower end members as well as a plurality of film holder members operably disposed between said top and bottom end members in a direction substantially parallel to the longitudinal axis of said holder fixture means;

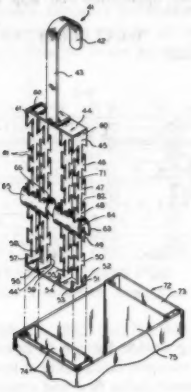
two or more of said film holder members comprising an alternating series of substantially trapezoid-shaped flange portions and substantially trapezoid-shaped recess portions so as to describe plurality of notched regions into which the opposite peripheral edges of a substantially bowed X-Ray film may be restrainably positioned;

each one of said two or more film holder members having said alternating series of flange portions and recess portions being in overall substantial alignment, with said flange and recess portions in a first of said two or more film holder members being in operable respective alignment with corresponding flange and recess portions in a second of said two or more film holder members,

said first and second aligned film holder members collectively describing aligned ones of said notched regions for

each of said bowed X-Ray films positionable therewithin so as to describe at least two notched regions into which each of said opposite peripheral edges of said bowed film comes into restrainable contact;

fixture position maintenance means operably attached along one of said upper and lower ends for facilitating the loading, maintenance and unloading of said film holder apparatus in and from said conventional developing tank insert tray;



means for precluding the undesired and inadvertent contact of articles with said bowed films restrainably positioned within said film holder apparatus,

said holder fixture means being of such a thickness and height with said bowed films restrainably positioned therewithin so as to be closely and telescopically received by one or more of said developing tank's insert trays.

4,514,073

AUTOMATIC EXPOSURE CONTROL CAMERA

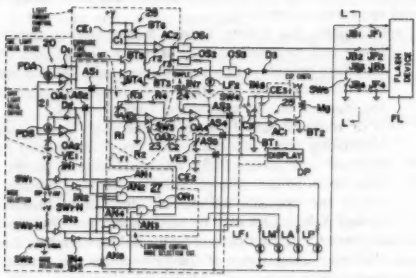
Nobuyuki Taniguchi, Tondabayashi; Hiroshi Hosomizu, Nara; Toru Inoue, Toyonaka; Masaaki Nakai, Nara; Takanobu Omaki, Sennan; Masatake Niwa, and Minoru Sekida, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 540,039

Claims priority, application Japan, Oct. 21, 1982, 57-185638

Int. Cl.³ G03B *17/08, 15/05, 17/18*

U.S. Cl. 354—414 **10 Claims**



1. An automatic exposure control camera capable of controlling both the camera exposure and the flash light amount to be emitted by an electronic flash device comprising:

means for measuring light and capable of alternatively producing a first signal indicative of a light measuring result covering a relatively wide area of the object scene and a second signal indicative of a light measuring result covering a relatively narrow area of the object scene;

first means for automatically controlling the camera exposure in response to said first signal and said second signal and including means for selectively storing either said first or second signal prior to actual exposure, said first controlling means being respective to the signal stored by said storing means;

second means for automatically controlling the flash light amount in response to said first signal; and

means for selecting said first controlling means from said second controlling means to respond to said first and second signals, said selecting means including first means for interconnecting said first controlling means with said measuring means to enable said first controlling means to selectively respond to either of said first and second signals in controlling the camera exposure, and said selecting means further including second means for interconnecting said second controlling means with said measuring means to restrict said second controlling means to respond to said first signal in controlling the flash light amount.

4,514,074

EXPOSURE CONTROL CIRCUIT FOR TTL AUTOMATIC ELECTRONIC FLASH

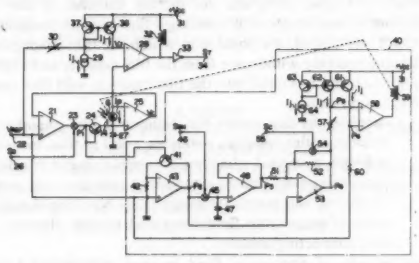
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,455

Claims priority, application Japan, Dec. 28, 1981, 56-211657

Int. Cl.³ G03B *7/16*

U.S. Cl. 354—416 **13 Claims**



1. In a TTL direct photometry camera capable of photometry of reflection from a film surface and having the capability to control the amount of light emission from a TTL automatic electronic flash, an exposure control circuit associated with the TTL automatic electronic flash, comprising:

a photometric circuit for deriving a voltage corresponding to an output current from a photoelectric transducer element which is used for the purpose of photometry:

a circuit for calculating a diaphragm value, the circuit being operative whenever the TTL automatic electronic flash is used in combination with the camera, and responsive to the magnitude of the output voltage from the photometric circuit which depends on the brightness of an object being photographed, for calculating a diaphragm value for the camera to establish an exposure period which is equal to or greater than the exposure period synchronized with the operation of the electronic flash so long as the brightness value is below a predetermined upper limit;

a reference voltage circuit for providing a reference voltage corresponding to the exposure period which is equal to or greater than the exposure period synchronized with the operation of the electronic flash;

a comparator for comparing an output voltage from the

calculation circuit against the reference voltage supplied from the reference voltage circuit;

means for controlling a diaphragm opening in accordance with an output from the comparator; and

an exposure control circuit for establishing an exposure period in accordance with the brightness of an object being photographed.

4,514,075

AUTOMATIC CONTROL APPARATUS FOR PHOTOGRAPHIC CAMERA

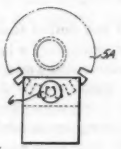
Kiyoshi Negishi; Masahiro Kawasaki, both of Tokyo, and Eiichi Tano, Kamifukuoka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

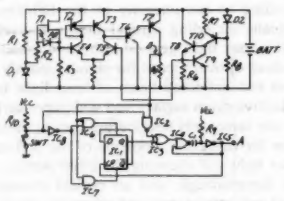
Filed Apr. 28, 1981, Ser. No. 258,043

Claims priority, application Japan, Apr. 30, 1980, 55-59668[U]

Int. Cl.³ G03B 7/08

U.S. Cl. 354—446 **12 Claims**





1. Automatic control apparatus for a photographic camera comprising:

means for stopping down a diaphragm;

first means for generating square wave pulses, the number of which represents the extent of diaphragm stop down, the square wave pulses alternately assuming an H-level and an L-level;

second means for generating short pulses responsive to the leading and trailing edges of the square wave pulses, the second pulse generating means comprising a bistable device alternately assuming the H-level and the L-level, an exclusive OR gate having a first input, a second input and an output that assumes the H-level when either the first input or the second input but not both assume the H-level, and otherwise assumes the L-level, means for connecting the bistable device to the first input, means for connecting the first pulse generating means to the second input, and means for inverting the state of the bistable device each time the output of the exclusive OR gate assumes the H-level;

means for counting the short pulses; and

means for arresting the diaphragm stop down means after a predetermined number of short pulses are counted.

4,514,076

PHOTOGRAPHIC CAMERA

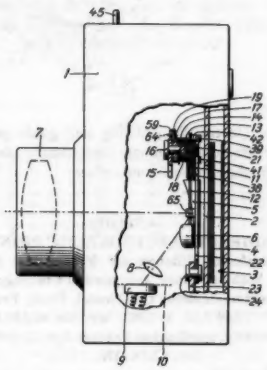
Peter Loseries, Wetzlar-Nauborn, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzler GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,595

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247764

Int. Cl.³ G03B 7/099

U.S. Cl. 354—481 **9 Claims**



1. A photographic finder camera, adapted to utilize interchangeable photographic lens objectives and having a shutter and a photoelectric detector system for measuring light flux passing through the photographic lens objective being utilized, wherein:

(a) the photoelectric detector system is mounted in a plane in which a representative light flux can be collected from various image heights and all apertures of the photographic lens objective being utilized;

(b) at least one optical component is movably disposed in the camera housing, said movable component being pivoted in front of the aperture of said camera parallel to a plane defined by film in the camera and directing when in a use position in the beam path of said photographic lens objective at least part of the light flux coming from the object to be measured and passing through the photographic lens objective, to the photoelectric detector system; and

(c) control means are provided which selectively bring said movable optical component into the use position and transfer the optical component into a non-use position depending on actuation of the camera shutter.

4,514,077

MAGNETIC TONER DEVELOPING DEVICE

Virgil W. Westdale, Barrington; James L. Hanrahan, Mt. Prospect, and William C. Anderson, McHenry, all of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Feb. 18, 1983, Ser. No. 467,781

Int. Cl.³ G03G 15/09

U.S. Cl. 355—3 DD **4 Claims**

1. A magnetic toner developing device for developing an image on a charged sheet during transport of the sheet through a development zone comprising:

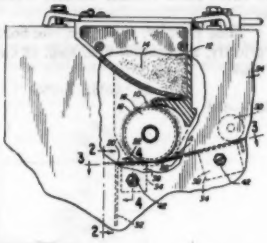
a support frame;

a magnetic developer roller brush for applying a single component toner to the sheet;

means for supplying a relatively thin layer of said single component toner to the developer roller brush;

a guide plate extending beneath the developer roller brush in close proximity thereto for supporting the sheet in its

transport through the development zone formed between the developer roller brush and the guide plate; and



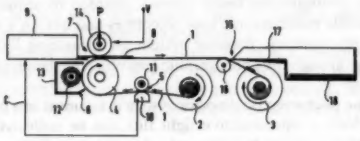
means for electrically isolating said guide plate from said support frame to eliminate electrostatic clamping of said charged sheet to said guide plate.

4,514,078

INDIRECT ELECTROSTATIC PRINTER

Michel Béduchaud, Villebon sur Yvette, and Patrice Playe, Houilles, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Apr. 4, 1983, Ser. No. 482,084
Claims priority, application France, Apr. 2, 1982, 82 05726
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 BE **4 Claims**



1. An indirect electrostatic printer using an intermediate image medium, said printer comprising:

a printing station for printing an electrostatic latent image on the intermediate medium,

a developer station for developing the image on the intermediate medium,

a combined transfer and fixing station for both transferring the image onto a final medium and for fixing the image thereon, and

a coply delivery station,

the improvement wherein said intermediate image medium comprises a flexible dielectric tape and

means for mounting said tape in an open loop path running in sequence from a supply reel as a lower run, around an auxiliary roller from bottom to top over which its path is folded forming a top run passing across and above the supply reel and onto a take up reel, said open loop path running through all three of said stations in succession,

means for driving said tape comprising at least one of said take up reel and said auxiliary roller,

a pressure roller operatively associated with said auxiliary roller to define said combined transfer and fixing station for simultaneously transferring and fixing the image on the final medium, and

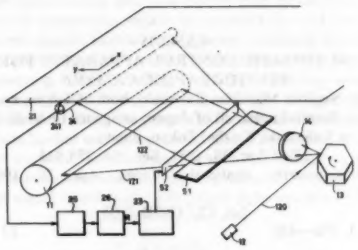
means for supplying said final medium in the form of individual sheets to said combined transfer and fixing station between the nip of said pressure roller and said dielectric tape while in contact with the periphery of said auxiliary roller for driving said sheets by said auxiliary roller and said pressure roller onto the top run of said dielectric tape for conveying said sheets sequentially to said copy delivery station.

4,514,079

OPTICAL INPUT AND OUTPUT SCANNING SYSTEM

Kunihiro Okada, Nishitama; Hirohide Endo, Tokorozawa; Susumu Saito, Hachiohji, and Kenji Kataoka, Kawagoe, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,901
Claims priority, application Japan, Jul. 20, 1981, 56-112169
Int. Cl.³ F03G *15/04*
U.S. Cl. 355—8 **5 Claims**



1. An optical input and output scanning system comprising: generating means for generating a laser light in the form of a beam; a photo-conductive drum adapted to be formed with an electro-latent image according to the intensity of said laser light; a sheet of paper carrying a picture image to be received; scanning means including an optical system for condensing said laser light upon said photo-conductive drum and said paper to linearly scan the surfaces of said photo-conductive drum and said paper; and photoelectric converting means for receiving the laser light reflected from the paper surface scanned by said scanning means and for generating an electric signal according to the intensity of the light received, said scanning means including optical means for reflecting and deflecting the laser light generated by said generating means and distributing optical means for simultaneously distributing the reflected and deflected beam of laser light between said photo-conductive drum surface and said paper surface thereby to irradiate the same, said distributing optical means including a half mirror for reflecting a portion of the deflected incident beam of laser light and allowing the other portion of the same to transmit therethrough; and an optical shutter interposed between said half mirror and said photo-conductive drum for enabling one of passing and blocking of said laser light to said photo-conductive drum.

4,514,080

APPARATUS FOR CONTROLLING OPTICAL SYSTEM FOR COPYING MACHINE

Kiyoshi Matsuzawa, and Noriyuki Inoue, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,480
Claims priority, application Japan, Jul. 26, 1982, 57-130053
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **5 Claims**

1. An apparatus for controlling an optical system in a copying machine, said optical system being movable to a plurality of positions at which different reduction/magnification factors are obtained, said apparatus comprising:

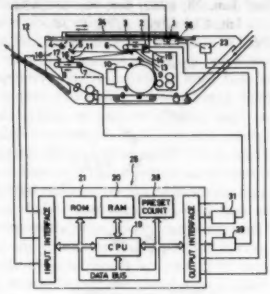
first means for generating a first signal corresponding to a desired one of said plurality of reduction/magnification factors;

second means responsive to said first signal for providing a desired position signal representing the distance from a predetermined reference position to the position corresponding to said desired reduction/magnification factor;

third means for generating a current position signal corre-

sponding to the distance from said predetermined reference position to the present position of said optical system;

fourth means responsive to said current and desired position signals for generating a difference signal representing the



distance and direction from said current position to said desired position; and

fifth means responsive to said difference signal for moving said optical system to said desired position.

4,514,081

IMAGE MAKING SYSTEM AND APPARATUS THEREFOR

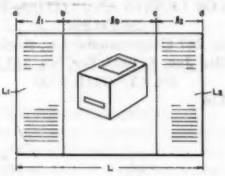
Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 347,933, Feb. 11, 1982,. This application Feb. 10, 1983, Ser. No. 465,576

Claims priority, application Japan, Feb. 17, 1981, 56-22106

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **2 Claims**



1. An image forming apparatus capable of forming a combined image including an image corresponding to an original and an image corresponding to an information signal comprising:

a movable member;

an original supporting means;

scanning means movable relative to said original supporting means for scanning the original;

an adjusting member to set the position of the rear end of the original, the adjusting member being mounted on said original supporting means at a position along the side of which the scanning of the original by said scanning means is completed;

conveying means to convey a transfer material toward said photosensitive member;

variable setting means for setting a first time during the imaging operation for initiating the projection of light corresponding to said information signal to said photosensitive member, and for setting a second time, which is later than said first time, for initiating the projection of light corresponding to the original to said photosensitive member; and

setting means for setting a time for initiating the movement of said conveying means in correspondence with the said first time.

4,514,082

PATTERN GENERATOR FOR INTEGRATED CIRCUITS AND PROCESS OF GENERATING PATTERNS BY MEANS OF SAID GENERATOR

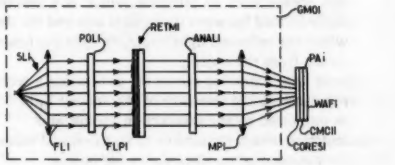
Catherine Gueugnon, Paris, and Pierre Bernstein, Meudon, both of France, assignors to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Nov. 23, 1983, Ser. No. 554,804

Claims priority, application France, Nov. 29, 1982, 82 19997

Int. Cl.³ G03B *27/44, 27/32*

U.S. Cl. 355—54 **6 Claims**



1. A pattern generator for integrated circuits consisting of a stack of various layers comprising: a source (SLI) transmitting a beam of light; for each one of the layers at least one associated reticle (RETMI) bearing patterns to be reproduced thereon and which is transparent, at least one portion of its surface, to the beam of light from said source; optical means (MPI) for projecting the image of the patterns onto a layer coated with photosensitive resin, a light polarizer (POLI) connected to the source, the reticle (RETMI) comprising a thin layer of magnetooptical material with a magnetization which is at right angles to its surface, where the patterns are made up of magnetic domains (D1, D2, D3) with a given shape and a given magnetization which is opposite to the magnetic environment surrounding them, the image of said pattern being restituted by a light meter (ANALI).

4,514,083

DISTANCE MEASURING APPARATUS

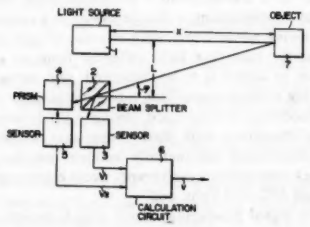
Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,909

Claims priority, application Japan, Feb. 3, 1981, 56-14700

Int. Cl.³ G01C *3/10;* **G01B** *11/26*

U.S. Cl. 356—1 **12 Claims**



1. A distance measuring apparatus comprising:

illumination means for projecting a collimated light beam of a reduced cross sectional area toward an object whose distance is being determined along an optical axis;

beam splitting means disposed at a given distance from the illumination means in a direction perpendicular to the optical axis therefor for receiving collimated light re-

flected from the object and for splitting the received light into a first and a second light component;

first light detecting means for generating a first signal representing the intensity of the first light component from the beam splitting means;

optical conversion means having a predetermined index of refraction and having at least one surface defining a boundary with an adjacent media having a different index of refraction, said optical conversion means receiving the second light component from the beam splitting means, said second light component impinging on said one surface at an angle of incidence near its critical angle, said optical conversion means altering the intensity of the second light component by reflection at said surface, said second light component exiting from said optical conversion means with an intensity which is a function of the angle formed between the optical axis and the direction in which the reflected light impinges upon the beam splitting means from the object;

second light detecting means for generating a second signal representing the intensity of the second light component as outputted by the conversion means; and

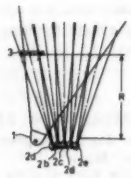
calculation means responsive to said first and second signals for calculating the distance to the object.

4,514,084

DISTANCE MEASURING APPARATUS

Hiroshi Makino, Hirakata; Masaru Higuchi, Toyonaka, and Kazuou Murata, Settsu, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Feb. 24, 1982, Ser. No. 352,066
Claims priority, application Japan, Mar. 3, 1981, 56-30736
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—4 **1 Claim**



1. A distance measuring apparatus comprising:

light projecting means for projecting a flash of light which spreads as it travels from a discharge lamp which discharges by consuming a charge stored in a capacitor,

light receiving means comprising an array of light receiving devices for receiving light reflected from an object, a distance to which is to be measured, said array of light receiving devices comprising a predetermined number of light receiving devices each having a predetermined restricted directivity with their optical axes of directivities at predetermined substantially uniform angular pitches, and each outputting signals respectively representing their received reflected light, and

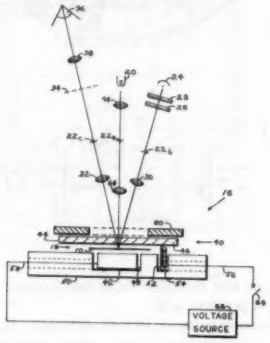
a distance signal producing circuit which detects the one signal which is the highest output level among plural output signals output by said light receiving devices, said distance circuit comprising a differentiating circuit for differentiating said output signals of said light receiving devices to thereby produce a distance signal by comparing said detected highest output level with plural predetermined reference levels corresponding to respective various distances.

4,514,085

MARKING AND AUTHENTICATING DOCUMENTS WITH LIQUID CRYSTAL MATERIALS

Wilbur I. Kaye, Corona del Mar, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 28, 1982, Ser. No. 392,838
Int. Cl.³ G06K *7/10, 9/74*
U.S. Cl. 356—71 **14 Claims**



1. A method of repeatably authenticating documents comprising the steps of:

(1) applying a liquid crystal material to the document, which material exhibits a predetermined response to an electrical or magnetic stimulus, and

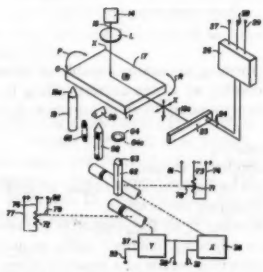
(2) examining the document for detectable characteristics of the predetermined response of the liquid crystal material when said stimulus is applied.

4,514,086

APPARATUS FOR MEASURING REFRACTIVE PROPERTIES OF LENSES AND OTHER TRANSMISSIVE DEVICES

Edward V. Stine, 247 Congressional La., Rockville, Md. 20852

Filed Jan. 5, 1982, Ser. No. 337,275
Int. Cl.³ G01B *9/00*
U.S. Cl. 356—124 **3 Claims**



1. An apparatus for automatically measuring the deflection of a radiation beam for determining certain parameters of a diverting means, said apparatus comprising: a radiation generating means, a reflective surface of a substantially planar base, a supporting means, a first rack means, a second rack means, radiation detection means, drive means, signal processing means, spring means and measuring means; said radiation generating means directing a beam of radiation onto said reflective surface, said diverting means being interposed between said radiation generating means and said reflective surface for

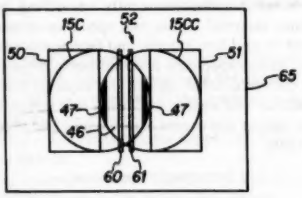
deflecting said radiation beam, said supporting means supporting said base upon a fixed pivot for movement of said base in mutually-perpendicular X and Y plane, said first rack means being operatively connected to said base to move said base in said X plane about said fixed pivot, said second rack means being operatively connected to said base to move said base in said Y plane about said fixed pivot, said radiation detection means detecting the amount of deviation of the deflected radiation beam, said drive means including respective servo motors having respective shafts provided with first and second pinions, said signal processing means being responsive to said radiation detection means to actuate said servo motors to rotatively drive said shafts, said first and second pinions operatively engaging said first and second rack means, respectively, to move said base to a null position as defined by the deviation of the deflected radiation beam, said spring means being operatively connected to said base and said first and second rack means to constantly urge said base against said first and second rack means and to maintain said pinions in constant mesh with said respective rack means to preclude backlash, and said measuring means being operatively associated with the rotation of said respective shafts to measure the amount of the deviation in said X and Y planes.

4,514,087

RING LASER GYROSCOPE READOUT FOR PARTIALLY OVERLAPPING BEAMS

Frederick Vescial, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 23, 1982, Ser. No. 410,790
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **18 Claims**



1. A ring laser gyroscope comprising:
a laser ring having counter rotating light beams which have a frequency difference relatable to the rate of rotation of said ring about an axis of rotational sensitivity,
means for removing a portion of the counter rotating light beams from the ring,
means for displacing the removed counter rotating beams whereby a portion of the light of the removed beams overlaps and a portion of each of the beams does not overlap,
means for receiving said displaced beams including means for detecting each non-overlapping beam portion and means for detecting fringe motion of said overlapping beams.

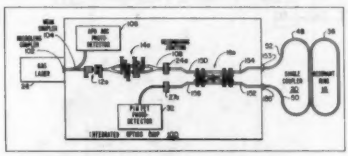
4,514,088

SINGLE-COUPLER GUIDED-WAVE PASSIVE RESONANT-RING OPTICAL-GYRO INSTRUMENT

Joseph D. Coccoli, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambrige, Mass.

Filed Apr. 1, 1983, Ser. No. 481,481
Int. Cl.³ G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **7 Claims**

1. A single-coupler guided-wave passive resonant-ring optical gyro instrument responsive to a coherent light source, comprising:
an optical-fiber resonant ring;
a single wave coupler for exciting input clockwise and counterclockwise traveling waves in said resonant ring and for extracting the output signals representative of the level of excitation of those waves;
switching means for selectively, alternately applying the light waves from the coherent light source to the clockwise and counterclockwise inputs of said single wave coupler;
means for selectively exciting the orthogonal polarization states of the optical modes of the resonant ring;



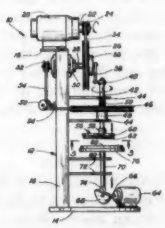
means for separating the orthogonal polarization states of the optical modes of the resonant ring;
means for tuning the optical frequency of the input light waves to match and track the resonant frequencies of said resonant ring; and
means for sensing said output signals representative of the level of excitation of the clockwise and counterclockwise waves in the resonant ring.

4,514,089

APPARATUS TO PROCESS PIZZA DOUGH

Armando E. Meynet, 674 Keil St., Elmont, N.Y. 11003

Filed Jul. 26, 1984, Ser. No. 634,457
Int. Cl.³ B28C *1/16*; A21C *1/00*
U.S. Cl. 366—69 **10 Claims**



1. An apparatus to process pizza dough, and the like, said apparatus comprising:
a platform having a surface to support the dough to be processed;
a platen having a work surface spaced from said platform;
a plurality of spaced apart finger-like projections projecting from said work surface and positioned to operatively come in contact with the dough;
said platform and said platen being movable relative to one another;
first motive means to cause said platform and said platen to oscillate relative to one another along an axis perpendicular to said dough support surface;
second motive means to cause said platform and said platen to move relative to one another in a plane parallel to said dough support surface; and
said first and second motive means coupled to operate in a predetermined timed relationship to one another;
whereby said projections engage the supported dough during operation of said first and second motive means to process the dough.

4,514,090

APPARATUS FOR PROCESSING VISCOUS SUBSTANCES OR SUBSTANCES WHICH BECOME VISCOUS THROUGH PROCESSING

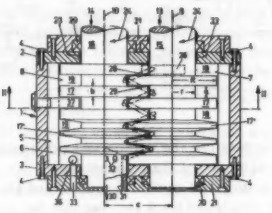
Wilhelm Neubauer, Murr, and Hans Werner, Stuttgart, both of Fed. Rep. of Germany, assignors to Werner and Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,559

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208973

Int. Cl.³ B29B *1/06;* **B01F** *7/12*

U.S. Cl. 366—91 **12 Claims**



1. An apparatus for processing viscous substances, or substances which can be made viscous during processing, said apparatus comprising a casing having at least two bores with at least one gusset area between them, two disk rotor means each comprising an elongated rotatable shaft provided with closed disks mounted in corresponding ones of said bores, the disks having a limited clearance with respect to the walls of the bores and defining between them at least one chamber having a damming-back point, said chamber having an outlet in front of said damming-back point, said outlet forming an overflow passage in at least one of said gusset areas and extending tangentially to a particular disk in the direction of a longitudinal axes of the elongated disk rotors, said disks interconnecting oppositely displaced chambers in the direction of the longitudinal axes, said disk rotors being arranged in an axially parallel relationship, partly interpenetrating the bores, the disks of each disk rotor projecting into the chamber or into each other disk rotor, and the outer circumference of the disks being clearance-free with respect to the shaft of the other rotor.

4,514,091

CONTAINER ASSEMBLY FOR VISCOUS TEST SPECIMEN MATERIALS

Klaus P. Kaspar, Tutzing; Jürgen Becker, Penzberg-Maxkron, and Marion Huber, Kleinengstingen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,491

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139702

Int. Cl.³ B01F *13/00*

U.S. Cl. 366—130 **20 Claims**

1. A container assembly for treating a viscous specimen material comprising:

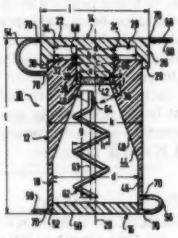
a container main body having at least one open end and defining a container interior within which specimen material may be treated;

a cover on said container main body for closing said at least one open end to seal said container interior;

a projecting part extending from said cover on that side of the cover facing said container interior, said projecting part being formed with a specimen recess with a predetermined volume for receiving an equal volume of viscous specimen material, said recess opening in said container interior when said cover is closed, said projecting part having a first planar annular end face surrounding said recess and further having an outer circumferential surface adjacent said end face and extending between said end face and said side of said cover facing said container interior, said annular end face lying completely within a single, flat, level plane and extending continguously from the rim of said recess between said recess and said outer circumferential surface;

wiping means defined on said container main body shaped in conformance with said projecting part for wiping excess material deposited on said outer circumferential surface away from said first annular end face; and

excess material receptacle means for receiving excess material wiped by said wiping means, said excess material receptacle means being defined as a volume between said



cover and said container main body, which volume is sealed when said cover is closed;

said predetermined volume of viscous specimen material being obtainable for treatment within said conainer interior by filling said specimen recess with said viscous specimen material and subsequently smoothing said viscous specimen material within said specimen recess to a level defined by said first annular end face across said specimen recess, excess specimen material being deposited on said outer circumferential surface and adjacent said first annular end face and finally, in closing said cover, said wiping means wiping said excess material into said excess material receptacle.

4,514,092

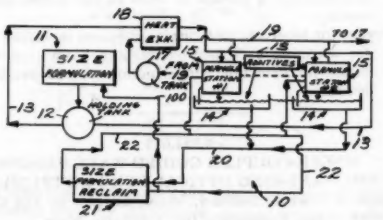
AUTOMATED SIZING SYSTEM CONTROLLING

Frederick D. Pritchard, Clarksville, and John E. Pittard, Halifax, both of Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed May 4, 1983, Ser. No. 491,274

Int. Cl.³ B01F *15/02*

U.S. Cl. 366—136 **45 Claims**



1. A method of providing size formulation to one or more of a plurality of size boxes associated with a plurality of slashers, comprising the steps of:

(a) at atmospheric pressure, mixing and heating a number of size formulation components to produce a size formulation having a predetermined composition and temperature;

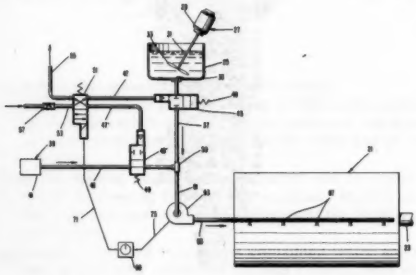
(b) pumping the size formulation in a closed loop past each of said size boxes;
(c) sensing the amount of size in each size box; and
(d) responsive to a predetermined condition sensed in step (c), withdrawing size formulation from said closed loop and supplying it to a size box.

4,514,093

METHOD AND APPARATUS FOR DELIVERY OF A POWDER

Lester Coch, Northport, and Kurt Rauch, Kew Gardens, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island City, N.Y.

Filed Feb. 1, 1983, Ser. No. 463,023
Int. Cl.³ B01F 9/04
U.S. Cl. 366—138 **8 Claims**



8. A method of intermittently delivering an insoluble powder to a processing station, comprising the steps of:
supplying a slurry comprised of the insoluble powder and at least water;
pre-flushing a fluid network for supplying fluids to the processing station;
delivering a predetermined quantity of the slurry through the fluid network to the processing station;
post-flushing the fluid network to remove any residual slurry; and
agitating the slurry prior to delivery to the fluid network.

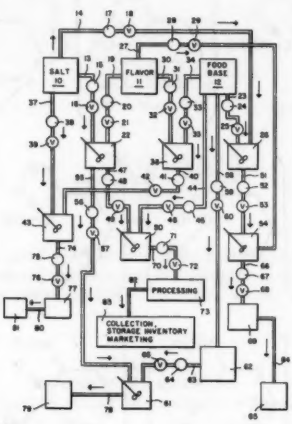
4,514,094

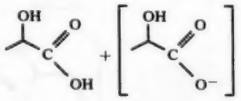
MIXED SEASONING

Lawrence Buckholz, Jr., Jackson; Richard A. Wilson, Westfield, and Roger Kleinberg, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

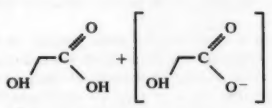
Division of Ser. No. 507,289, Jun. 23, 1983, Pat. No. 4,471,002, Continuation-in-part of Ser. No. 455,766, Nov. 30, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 604,265
Int. Cl.³ A23L 1/22; A23C 19/00
U.S. Cl. 366—160 **3 Claims**

1. Apparatus for producing a flavored foodstuff having a variable composition depending upon marketing information input used to control the apparatus using an electronic program controlling means comprising:
(i) at least one mixing vessel having a means of ingress and a means of egress;
(ii) means for supplying in controlled and variable amounts according to market requirements to at least one of said mixing vessels, a variably mixed seasoning composition of matter consisting essentially of:
(a) from about 0.25 up to about 0.80 mole percent on a dry basis of a lactic acid/lactate species mixture having the structures:





(b) from 0 up to about 0.09 mole percent on a dry basis of glycollic acid/glycollate ion species mixture having the structure:



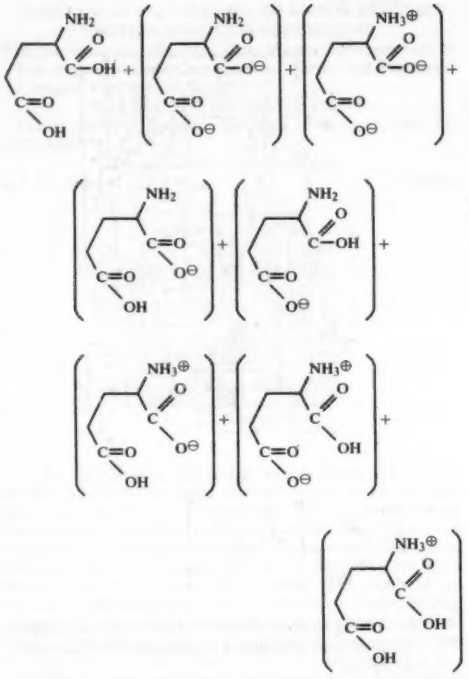
(c) from 0 up to about 10.0 mole percent on a dry basis of magnesium ion;
(d) from about 6 mole percent up to about 50 mole percent on a dry basis of a phosphate/monoacid phosphate/diacid phosphate/phosphoric acid species mixture having the formula:

$$[PO_4^{\equiv}]+[HPO_4^{=}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate;
(e) from 0 mole percent up to about 40 mole percent on a dry basis of sodium ion;
(f) from about 8 mole percent up to about 50 mole percent on a dry basis of potassium ion;
(g) from about 0.3 mole percent up to about 16 mole percent on a dry basis of chloride ion;
(h) from 0 mole percent up to 30 mole percent on a dry basis of carbonate/bicarbonate/carbonic acid species mixture having the formula:

$$[CO_3^{=}]+[HCO_3^{-}]+H_2CO_3$$

(j) from 0 mole percent up to about 2.0 mole percent on a dry basis of monobasic glutamate/dibasic glutamate/-glutamic acid species mixture having the formulae:



(k) from 0 up to about 0.6 mole percent on a dry basis of calcium ion;

with the provisio that the sum total of mole percent on a dry basis of sodium ion, potassium ion, magnesium ion and calcium ion is from about 48 mole percent up to about 60 mole percent; and with the proviso that the sum total of carbonate/bicarbonate/carbonic acid ion species mixture having the formula:

$$[CO_3^{=}]+[HCO_3^{-}]+H_2CO_3$$

taken together with the sum total mole percent on a dry basis of the phosphate/monobasic phosphate/dibasic phosphate species mixture having the formula:

$$[PO_4^{\equiv}]+[HPO_4^{=}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate is from about 50 mole percent the term "mole percent" being based upon the total moles of cations, anions and free organic acid which is substantially non-ionized in the composition;

(iii) means for supplying to at least one of said mixing vessels at a variably controlled rate according to market requirements and according to the rate of input of said mixed seasoning composition a flavoring formulation;

(iv) means for supplying to at least one of said mixing vessels in a variably controlled manner according to market requirements and according to the rate of supply of said flavoring formulation and said mixed seasoning composition, a foodstuff base; and

(v) means for conveying at variable mass flow rates accoridng to market input using electronic program control systems, said mixed seasoning composition, said flavoring formulation and said foodstuff to blending means whereby said mixed seasoning composition, said flavoring formulation and said foodstuff are blended in accordance with market requirements using said electronic program control systems.

4,514,095

MOTIONLESS MIXER

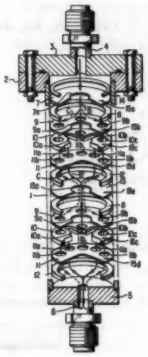
Wolfgang Ehrfeld, and Gunther Krieg, both of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,179

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241089

Int. Cl.³ B01F *5/06*

U.S. Cl. 366—340 **5 Claims**



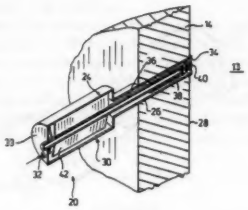
1. A motionless mixer for blending a fluid, comprising a tubular casing having a longitudinal axis and an inner cross-sectional contour; a fluid inlet and a fluid outlet axially spaced from one another in said casing and defining a flow direction of the fluid from the fluid inlet to the fluid outlet; a plurality of discs each having opposite faces and throughgoing apertures for allowing passage of the fluid; said discs having a periphery conforming to said inner cross-sectional contour; said discs being supported in said tubular casing in a face-to-face oriented relationship to form an axially extending disc stack; the apertures in said discs forming a core channel and fringe channels in said stack for dividing a fluid stream into a core stream and fringe streams in a first zone, for dividing the core stream into fringe streams in a second zone being downstream of said first zone as viewed in said flow direction and for centripetally combining said fringe streams into a central stream in a third zone being downstream of said second zone; and means for preventing said discs from angular displacements relative to one another; said discs comprising a first disc having a central opening and a plurality of spaced peripheral openings; a second disc adjoining downstream said first disc and having a central opening, a plurality of elongated openings extending radially from the central opening of the second disc, peripheral openings in said second disc situated between the elongated openings thereof; said peripheral openings in said second disc being in axial alignment with respective said peripheral openings of said first disc; a third disc adjoining downstream said second disc and having a plurality of peripheral openings being in alignment with respective said peripheral openings of said second disc and with outer zones of said elongated openings; a fourth disc situated downstream of said third disc and having a central opening; said fourth disc being maintained at an axial distance from said third disc by spacer means; said first disc being situated in said first zone, said second and third discs being situated in said second zone and said fourth discs being situated in said third zone.

4,514,096

FURNACE WALL ASH DEPOSIT FLUENT PHASE CHANGE MONITORING SYSTEM

John R. Wynnyckyj, Kitchener; Edward Rhodes, Waterloo, and Allan K. Chambers, Edmonton, all of Canada, assignors to University of Waterloo, Waterloo, Canada

Division of Ser. No. 320,604, Nov. 12, 1981, Pat. No. 4,408,568.
This application Sep. 2, 1983, Ser. No. 529,094
Int. Cl.³ G01K *17/00*; G01N *25/02*
U.S. Cl. 374—27 **2 Claims**



1. A heat flux measuring device, comprising:

an enclosed elongate housing having air flow paths extending therethrough from an air inlet adjacent one end of said enclosure to an air outlet adjacent the other end of said enclosure,

heat flux sensing means located adjacent said air outlet to permit air flowing through said enclosure to flow over said heat flux sensing means and prevent the build-up of ash thereon,

elongated evacuated tube means containing water and extending generally axially within said housing from adjacent said one end of said enclosure towards said other end of said enclosure,

heat sink means in heat conducting relationship with an end of said evacuated tube adjacent said other end of said enclosure, said heat flux sensing means being mounted to and in heat conducting relationship with said heat sink means, and

heat exchange means within said enclosure in heat conducting relationship with the other end of said evacuated tube, whereby, upon said flux sensing means being heated by heat flux, and heat sink means conducts said heat flux to said tube means to evaporate said water in said tube while said heat exchange means cools said tube and condenses the steam formed by said water evaporation, so that heat is removed from said flux detection means.

4,514,097

FRICTION BEARING ASSEMBLY HAVING A SERIES OF RINGS CONSTITUTING A BUSHING THEREFOR

Jeffery E. Daly, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

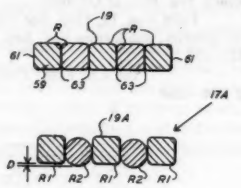
Filed Sep. 22, 1982, Ser. No. 421,213
Int. Cl.³ F16C *33/26*
U.S. Cl. 384—93 **12 Claims**

1. A rotary drill bit comprising:

a bit body having at least one depending leg at its lower end, said leg having a generally cylindrical bearing journal at its lower end;

a roller cutter having a recess of generally circular section therein receiving the bearing journal for rotatably mounting the roller cutter on the bearing journal; and

bushing means of generally annular configuration between the bearing journal and the roller cutter having an inner and an outer diameter so related to the diameter of the bearing journal and the diameter of the recess in the roller cutter as to enable the bushing means to rotate relative to both the bearing journal and the roller cutter, the bushing means further being of a width, as measured in the direction of its longitudinal axis, which is substantially greater than its thickness, as measured along a radius thereof, so as to present relatively large bearing surfaces, the bushing means comprising a plurality of relatively thin, narrow



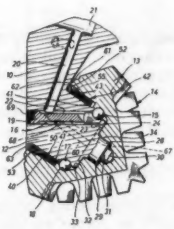
elongate metal members each formed (configured) into a circular (form) configuration and constituting a split ring having a single gap therein extending across the width thereof.

4,514,098

WOUND WIRE BEARING

Rodolfo M. Ippolito, Euless, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 1, 1982, Ser. No. 413,774
Int. Cl.³ E21B *10/22*, *10/24*; E16C *33/10*
U.S. Cl. 384—95 **14 Claims**



1. An earth boring member defining:

a body having a journal pin providing a first cylindrical surface;

a rotary cutter having an internal axially extending recess defining a second cylindrical surface for receipt therein of said first cylindrical surface;

journal bearing means interposed between said cylindrical surfaces for rotatably supporting said cutter on said pin, said means defining a sleeve-like member having an inner annular surface and an outer annular surface with one of said annular surfaces, prior to assembly, having a diameter requiring resilient deformation of said member upon assembly for positive non-rotative engagement with one of said cylindrical surfaces, such deformation thereby defining a corresponding deformation of the other of said annular surfaces for defining the diameter of a bearing surface in rotational bearing engagement with the other cylindrical surface; and,

axially opposed shoulder means extending radially from said cylindrical surface and abutting opposite axial ends of said bearing member to prevent axial movement of said bearing member with respect to said cylindrical surface; and wherein said journal bearing means comprises:

an axially helically wound wire member forming a series of helical turns, each turn providing a bearing surface independently translationally moveable with respect to the bearing surface of the next adjacent turn and said bearing surface of adjacent turns defining an axial space therebetween providing a lubricant reservoir.

4,514,099

HYDRODYNAMIC BEARING ASSEMBLY

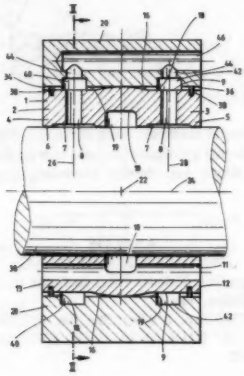
Erich John, and Erich Pollak-Banda, both of Augsburg, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk AG, Augsburg, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,259

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231133

Int. Cl.³ F16C *17/02*

U.S. Cl. 384—100 **8 Claims**



1. A hydrodynamic bearing assembly of the type wherein a shaft mounted therein exerts a load thereon, comprising:

a pair of hydrodynamic bearing races arranged side by side on the shaft and spaced apart from each other by an annular groove located therebetween said two bearing races being connected together to form an inner bearing member,

a housing located radially outwardly from said inner bearing member,

universal means interconnecting the inner bearing member with said housing for permitting limited universal swivelling movement of the inner bearing member within the housing, about a center point lying on the shaft axis and midway between the radial central planes of the two bearing races,

said annular groove opening onto the shaft, such that a portion of the fluid discharging from the two hydrodynamic bearing races flows along the interior of the inner bearing member to the annular groove, from which it is discharged, while another portion of said fluid flows oppositely, in a direction opposite from the annular groove, to the axial exterior of the inner bearing member,

at least one fluid passageway through the housing and through the inner bearing member, opening at the inner surface of the bearing races into fluid pockets located thereat,

said fluid passageway including an enlarged annular space formed between the radial inner surface of said housing and the adjacent outer surface of the inner bearing member.

4,514,100

MOUNTING APPARATUS FOR DOT MATRIX PRINT HEAD

Richard E. LaSpesa, Chicago, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.

Filed Aug. 19, 1983, Ser. No. 524,518

Int. Cl.³ B41J *3/10*

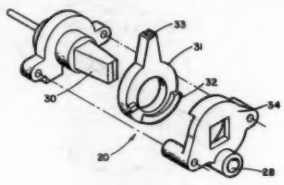
U.S. Cl. 400—55 **6 Claims**

1. Apparatus for releasably mounting a dot matrix print head on a carriage located in a printer and arranged to move the print head laterally across a record medium supported on a platen rotatably mounted in the printer, the carriage having a front and back portion, the front portion positioned near the platen, the apparatus comprising:

a cylindrical projection extending from the front portion of the carriage towards the back portion, the projection having its longitudinal axis substantially perpendicular to the path of travel of the carriage;

the print head having a nose portion and a tail portion and containing a plurality of actuatable print wires having their printing ends located in the nose portion;

the nose portion having a cylindrical opening extending



therethrough, the opening arranged to slidably receive the cylindrical projection such that the end of the projection enters through the first end of the opening and after passing through the entire length of the opening exits through the second end of the opening;

a rotatable camming surface positioned behind the second end of the opening so that the end surface of the projection butts up against a portion of the camming surface;

means for rotating the camming surface; and

means for applying a force to the print head to maintain the projection in the opening and against the camming surface.

4,514,101

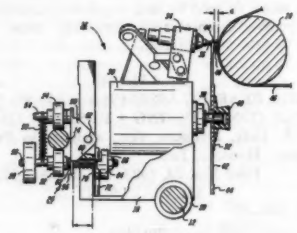
PAPER THICKNESS ADJUSTING MECHANISM FOR IMPACT PRINTER

Henry E. Smith, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 14, 1983, Ser. No. 561,266

Int. Cl.³ B41J *11/20*

U.S. Cl. 400—59 **3 Claims**



1. An impact printer comprising a platen, a pair of fixed guide rails positioned parallel to one another and said platen, a marking module including first bearing means for supporting said module upon one of said guide rails and second bearing means for supporting said module upon the other of said guide rails, said first and second bearing means supporting said module for reciprocating movement parallel to said platen, and including adjustment means for pivoting said first bearing means about the axis of said one of said guide rails, and for causing said second bearing means to rotate and to be laterally displaced about the axis of said other of said guide rails, said adjustment means being characterized by including

a toggle member including a first section pivotably connected to said marking module,

a rotatable shaft acting on a second section of said toggle member for moving said toggle member to shift the position of said marking module, said rotatable shaft being substantially normal to said guide rails,

said second bearing means including a first portion supported upon said toggle member, and a second portion supported upon said rotatable shaft, said first and second bearing portions opposing one another on opposite sides of said other of said guide rails,

biasing means for urging said first and second bearing portions toward one another,

resilient means for separating said marking module from said second section of said toggle member, and

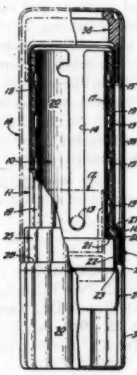
control means secured upon said rotatable shaft for adjusting the distance of separation between said marking module and said second section of said toggle member upon rotation of said shaft, said control means comprising positioning means and a control knob for locating said positioning means.

4,514,102

COSMETIC CONTAINER CONSTRUCTION

Walter T. Ackerman, Watertown, and Edward F. Klimeck, Waterbury, both of Conn., assignors to Eyelet Specialty Co., Inc., Wallingford, Conn.

Filed Oct. 4, 1983, Ser. No. 538,908
Int. Cl.³ A45D *40/06, 40/00*
U.S. Cl. 401—78 **16 Claims**



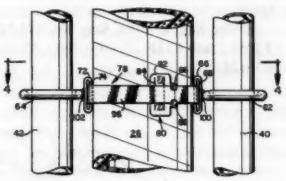
1. In a swivel lipstick or the like container having an open end for the dispensing of cosmetic substance, wherein a central carrier member of the container has a cam follower engaged to propulsion cams of inner and outer tubular members which are relatively rotatable to develop propel/repel displacement of the carrier member with respect to the open end of the container, and wherein a closure cap is removably applicable over the open end and in longitudinal overlap of the propulsion-cam region of the container with friction engagement to one of said tubular members, the improvement wherein the inner tubular member is of metal and is characterized (1) by a radially outward shoulder formation between an elongate upper propulsion-cam portion of lesser diameter and a circumferentially continuous first cylindrical base portion of greater diameter and (2) by a lower circumferentially continuous second cylindrical base portion of still greater diameter, wherein the outer tubular member includes a sleeve of molded plastic with an elongate cam-characterized bore in running clearance with the upper portion of said inner tubular member, and wherein the outer tubular member integrally includes a circumferentially continuous radially outward flange having a lower surface in thrust-bearing engagement with said shoulder formation and of diameter less than said greater diameter, and a circumferentially continuous cylindrical metal collar having a bore in metal-to-metal force-fitted assembly to the outer surface of said first base portion to thereby become part of the inner tubular member, said collar including at its upper end a radially inward flange in axially locating relation with the upper surface of the flange of said outer tubular member, said collar including at its lower end a radially outward flange formation, and a base cup member having a bore in force-fitted assembly to the outer surface of said second base portion of the inner tubular member, the bore of the closure cap engaging over said collar to the point of limiting abutment with the lower-end flange formation of said collar.

4,514,103

SAFETY GUIDES FOR USE WITH A ROTARY HOSE AND KELLY SPINNER HOSES AND THE COMBINATION THEREOF

Thomas J. Wise, and John N. Garratt, both of Houston, Tex., assignors to Goodall Rubber Company, Trenton, N.J.

Filed Jul. 28, 1982, Ser. No. 402,761
Int. Cl.³ F16L *3/22*
U.S. Cl. 138—106 **7 Claims**



1. A safety guide for kelly spinner hoses comprising:

a pair of opposed separate guide rings each adapted to loosely receive and guide a kelly spinner hose when it is attached at one end to a spinner, and

means for fixedly securing said rings to a rotary hose substantially in a plane perpendicular to the axis of the rotary hose so that the spinner hoses are positioned substantially parallel to the rotary hose and are adapted to slide and turn in the guides in response to wind and pressure and movement of the spinner hoses when they are being raised and lowered.

4,514,104

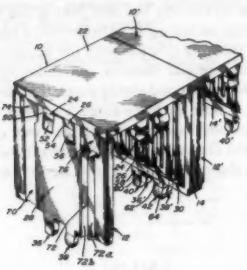
SELF-SUPPORTING ELEMENT FOR MOSAIC DISPLAY PANEL

Frank Taylor, St-Eustache, and Klemens Maurer, Candiac, both of Canada, assignors to Monitronik Ltee, Quebec, Canada

Filed Jun. 18, 1982, Ser. No. 390,056
Int. Cl.³ F16B *5/07*
U.S. Cl. 403—14 **7 Claims**

1. A self-supporting element for use in the assembly of a mosaic display panel, comprising: a rectangular body having a sidewall displaying on the outer face thereof outwardly projecting longitudinal guide means and longitudinal channel means spaced transversely from said guide means and disposed generally parallel thereto; said channel means having a cross-section so dimensioned as to include therein the cross-section of said guide means whereby the guide means and channel means of a similarly constructed sidewall of an adjacently disposed element slidably interfit in said channel means and said guide means, respectively; each said channel means including at one end thereof entry pocket means, having a width significantly than said channel means, for facilitating initial

engagement of the guide means of a first of two of said self-supporting elements with the channel means of a second of said



elements, and vice versa, during sliding motion of said elements with respect to each other.

4,514,105

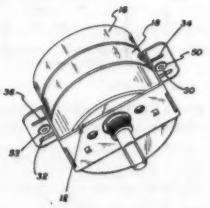
MOUNTING MEANS FOR TIMER-MOTOR ASSEMBLY

George W. Adams, Greenwood, and C. Bruce Banter, Indianapolis, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 1, 1982, Ser. No. 413,627

Int. Cl.³ F16D *1/00;* **F16F** *15/04;* **G05G** *17/00;* **F16H** *29/00*

U.S. Cl. 403—24 **1 Claim**



1. A timer-motor assembly comprising:
(a) A motor assembly,
(b) A timer assembly, and
(c) A bracket trapping said timer assembly between said motor assembly and said bracket, said bracket being U-shaped to cradle said timer assembly, said timer-motor assembly further comprising first ears extending from said bracket and having apertures therein, second ears extending from said motor assembly having apertures therein and mating said first ears, and rivet means extending through said apertures and connecting said first and second ears together.

4,514,106

TABLE UPRIGHT CONNECTOR MEMBER AND PROCESS FOR MAKING THE SAME

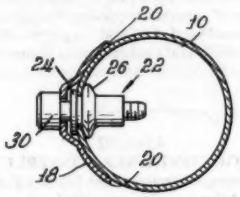
Mark T. Slager, 53654 Bruce Dr., Bristol, Ind. 46507

Filed Feb. 7, 1983, Ser. No. 464,776

Int. Cl.³ F16B *7/08*

U.S. Cl. 403—190 **2 Claims**

1. In a T-joint between tubular members comprising a tubular cross-member and a tubular stem member, the improvement which comprises:
a tubular segment complementary to said tubular cross-member and rigidly secured to the end of said stem member and having a radius of curvature slightly less than that of said tubular cross-member;
draw means for drawing said tubular segment onto said tubular cross-member in such a manner that the edges of said tubular segment first engage the tubular cross-member and are sprung apart until the inner surface of said tubular segment is in engagement with the outer surface of said tubular cross-member, said draw means comprising nuts having head portions and stem portions and being riveted into the wall of said tubular cross-member and bolts threaded therein having heads adapted to engage the outer surface of said tubular segment on each side of said tubular stem member, said head portions projecting above said stem portions passing through the wall of said tubular cross-member, said head portions abutting the outside of the wall of said tubular cross-member, and malleable portions integral with said stem portions and said head



portions, said malleable portions being upset into contact with the inner wall of said tubular cross-member in such a way that the wall around said stem portion is clamped between said head portions and said malleable portions, said head portions projecting above the surface of said tubular member, said tubular segment having depressions therein to receive the head portions of said nuts, which depressions have holes therein through which said bolts project and a flat outer surface on which the heads of said bolts seat, and in which the chord dimension of the tubular segment is substantially the diameter of the tubular stem member and the tubular stem member is welded onto said tubular segment along substantially 360° of contact, whereby the resistance of the tubular segment to being sprung is enhanced.

4,514,107

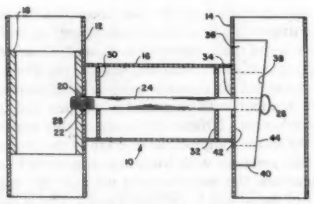
DEVICE FOR JOINING TUBULAR MEMBERS

Gil G. Moreno, 4106 Dellbrook Dr., Tampa, Fla. 33624

Filed May 25, 1983, Ser. No. 498,022

Int. Cl.³ F16B *7/08*

U.S. Cl. 403—230 **9 Claims**



1. A device for joining a transverse tubular member between two parallel members comprising in combination:
a first tubular member;
a second tubular member disposed parallel to said first tubular member;
a transverse tubular member extending between said first and second tubular members;
a first aperture defined by the wall of said first tubular member;

a rod extending through said first aperture;

anchoring means disposed within said first tubular member for anchoring one end of said rod;

a plurality of spacers disposed along the length of said rod, said spacers supporting said transverse tubular member relative to said rod;

a second aperture defined by the wall of said second tubular member;

a head disposed on said rod, said head being disposed at the end of said rod remote from said anchoring means;

a wedge disposed within said second tubular member for locking said head within said second tubular member when said head is introduced into said second tubular member through said second aperture;

said wedge defining a longitudinal slot, said slot being closed at one end such that when said wedge is introduced into said second tubular member said slot receivably engages said rod to urge a sloping wedge surface defined by said wedge into engagement with said head and to urge a curved surface defined by said wedge into engagement with the internal surface of said second tubular member; and

said sloping wedge surface and said curved surface of said wedge being disposed between said head and the internal surfaces of said second tubular member such that said wedge interacts with said head for rigidly securing said first, second and transverse members together.

4,514,108

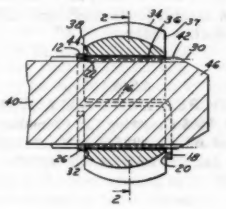
RETENTION RING FOR SPLINED JOINT

Daniel V. Sagady, Oxford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 8, 1982, Ser. No. 447,743

Int. Cl.³ F16D 1/10

U.S. Cl. 403—359 **14 Claims**



1. A splined joint for transmitting torque between connected members comprising:

an inner member having axially directed spline teeth formed on its outer surface and a groove formed near an axial end of the spline teeth;

an outer member having axially directed spline teeth meshing along their length with the spline teeth of the inner member;

a clip having a first arcuate ear located within the groove of the inner member and abutting an adjacent surface of the outer member, a second arcuate ear spaced axially from the first ear and abutting an adjacent surface of the outer member at the axially opposite side from that at which the groove is located, and an axially extending arm connecting the first and second ears preventing relative axial displacement of the first and second ears; and

means providing a space within which the arm of the clip is located.

4,514,109

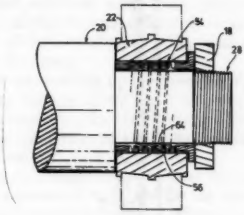
CIRCULAR LOCKING DEVICE

James J. McKenna, 157 Parkview Dr., Ancaster, Ontario, Canada

Filed Feb. 2, 1982, Ser. No. 345,064

Int. Cl.³ F16D 1/06

U.S. Cl. 403—370 **11 Claims**



1. A circular coupling for interconnecting an inner rigid element to a surrounding outer rigid element, said coupling comprising a coil arrangement of a first inner and second outer coil having a plurality of intertwined turns adapted to surround such inner element and fit within a hole in such outer element and compression means adapted to compress said coil arrangement along its axial length for displacing contacting coil turns of said coil arrangement to engage such inner element with such outer element, said compression means being capable of compressing said coil arrangement to an extent to provide sufficient frictional engagement of said coil arrangement with such inner and outer elements, the configuration of such inner and outer surfaces being such to provide sufficient areas of frictional contact to interconnect said elements, one of first inner and second outer coils having a mean diameter which is slightly greater than the diameter of the other of said first inner and second outer coils to prearrange adjacent coil turns to direct displacement of the coil turns during compression and the second outer coil having an axial length greater than that of said first inner coil for displacing said second outer coil outwardly when said compression means axially compresses said coil arrangement.

4,514,110

GATE ASSEMBLY FOR PONDS

Stanley Powell, Lowton, Near Warrington, England, assignor to British Nuclear Fuels Limited, Risley, England

Filed Dec. 21, 1982, Ser. No. 451,856

Claims priority, application United Kingdom, Dec. 30, 1981, 8139014

Int. Cl.³ E02B 7/26, 7/54

U.S. Cl. 405—104 **4 Claims**

1. A gate assembly for subdividing a pond, reservoir and the like into separate compartments comprising a frame having side and base members fixed in the walls and floor of the pond, reservoir and the like, a vertically movable gate slidable in and supported by the frame, a sealing member extending along the base and sides on one of the frame and the gate and cooperable with an opposing face on the respective gate and frame to effect a substantially liquid-tight seal therebetween, and cooperable wedge members on the frame and the gate to urge the gate into sealing engagement with the frame as the gate is lowered into position in the frame, in which the sealing member includes a primary seal and a secondary seal, the primary seal being a profiled block, two continuous spaced-apart sealing lips on the block engageable with said opposing face, a

channel in the block between the sealing lips, the secondary seal being housed in the channel and comprising a flexible and

inflatable member operable upon inflation to sealingly engage said opposing face on the respective gate and frame.

4,514,111

METHOD OF AND APPARATUS FOR INSTALLING SOLDER BOLTS IN ROCK BOLTING

Onni Issakainen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Sep. 28, 1982, Ser. No. 426,004
Claims priority, application Finland, Jun. 4, 1982, 822004
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **8 Claims**

1. A method of installing solder bolts into preformed hole in a rock, comprising the steps of:

(A) preforming of at least one said hole in the rock;

(B) filling of said hole with a soldering material;

(C) inserting of a portion of said bolt into said hole;

(D) producing of at least one bend on a fastening portion of said bolt extending out of said hole, said fastening portion of the bolt being bent to such extent that a width of an axial projection of said bolt becomes bigger than an inside diameter of said hole; and

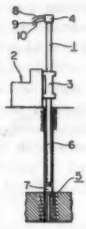
(E) inserting of said bended fastening portion of said bolt into said hole in a such manner that in an inserted condition said bolt is firmly pressed between opposite wall portions of said hole and is retained in a place by a force of friction between said bolt and said wall portions of the hole.

4,514,112

METHOD FOR INJECTING GROUTING AGENT AND APPARATUS FOR CONDUCTING THE METHOD

Sakae Sano; Hisashi Kitajima, both of Tokyo; Hiroshi Iimori, Yokohama, and Tadashi Nishio, Koganei, all of Japan, assignors to Ton Grout Kogyo Co., Ltd.; Mitsui Toatsu Chemicals, Inc. and Tonan Kaihatsu/Kogyo Co., Ltd., all of Tokyo, Japan

Filed Apr. 10, 1984, Ser. No. 598,648
Claims priority, application Japan, Apr. 19, 1983, 58-67786
Int. Cl.³ E02D *3/12*
U.S. Cl. 405—269 **6 Claims**



1. A method for injecting a grouting agent comprising a first step of injecting a grouting agent under a controlled injection pressure by setting a discharge rate to a low value, thereby keeping a tensile stress to be developed in the ground by the injection of the grouting agent lower than the tensile strength of the ground, and forming an initial injection region where the grouting agent is uniformly infiltrated in the vicinity of an injection rod among a desired region destined to the injection by the grouting agent in the ground, and

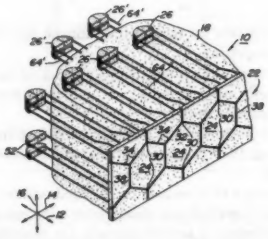
a second step of further injecting the grouting agent under a controlled injection pressure by continuously or stepwise increasing the discharge rate of the grouting agent, thereby keeping a tensile stress to be developed by the further injection of the grouting agent in the ground lower than the tensile strength in the ground outside the initial injection region, and forming an injection region where the grouting agent is further uniformly infiltrated outside the initial injection region.

4,514,113

EARTH RETAINING WALL SYSTEM

Albert Neumann, 5401 Graywing Ct., Columbia, Md. 21045

Filed Jul. 27, 1983, Ser. No. 517,639
Int. Cl.³ E02D *29/02, 17/00*
U.S. Cl. 405—286 **20 Claims**



1. An earth retaining wall system comprising:

(a) a substantially planar frontal wall including a multiplicity of matingly interfacing panel members including a liquid porous fabric layer inserted between said matingly interfacing panel members for allowing moisture to pass external said wall system;

(b) a plurality of anchor block members longitudinally aligned and displaced from said frontal wall panel members; and,

(c) means for coupling said anchor block members to said frontal wall panel members, said means for coupling said anchor block members to said frontal wall panel members including means for securing a pair of matingly adjacent interfacing panel members to a singular anchor block member, said means for securing said pair of matingly interfacing panel members being at least partially embedded within each of said matingly adjacent interfacing panel members.

4,514,114

SEED AND/OR FERTILIZER DISTRIBUTOR

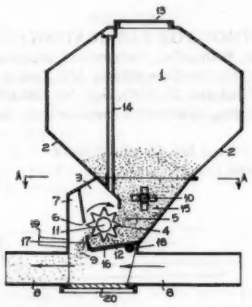
Albert K. Fuss, 1 Jellicoe St.; Eric W. Fuss, 3 Heller St.; Jarvis R. Fuss, 143 Tourist Rd., and Roy M. Fuss, 21 Leslie St., all of Toowoomba, Queensland, Australia (4350)

Filed Aug. 10, 1982, Ser. No. 406,698

Claims priority, application Australia, Jul. 8, 1982, PF4770

Int. Cl.³ B65G *53/46*

U.S. Cl. 406—65 **10 Claims**



1. An improved seed and/or fertilizer distributor having a hopper to contain seed and/or fertilizer, said hopper having a sealed top and opening at its lower part to metering means adapted to discharge measured quantities of seed and/or fertilizer into delivery duct means leading to distributor means, characterised by an equalizing chamber containing the said delivery means opening on a first side to the said hopper and on a second opposite side to a duct in turn opening to the said delivery duct means, said chamber extending above the said openings and having a closed top, metering means situated in the said equalizing chamber opening to the said chamber along its length and arranged to move measured quantities of seed and/or fertilizer from the said hopper to the said duct transversely through the said equalizing chamber over the floor thereof, said metering means being positioned to be confined in the said equalizing chamber between the said feed opening and the said discharge opening, and an air equalization line communicating at one end with the upper part of said equalizing chamber and at the other end with the upper part of the said hopper.

4,514,115

TAP HOLDER

Yukimasa Akashi, Minohshi, Japan, assignor to Showa Seiki Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1982, Ser. No. 413,644

Claims priority, application Japan, May 19, 1982, 57-85362

Int. Cl.³ B23G *1/46*; B23B *3/00*

U.S. Cl. 408—139 **7 Claims**

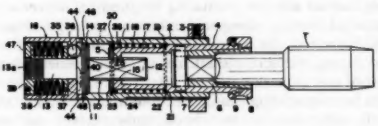
1. A tap holder adapted to be attached to a spindle of a machine, comprising

a cylindrical body to be rotated by said spindle, said cylindrical body having first and second means for defining a first space at the inner periphery thereof, said first and second means being axially spaced from each other to define the axial ends of the first space,

a tap holding spindle slidably situated in said cylindrical body, said tap holding spindle having means to receive a tap at a forward end thereof, and third and fourth means for defining a second space at the outer periphery thereof, said third and fourth means being axially spaced from each other to define the axial ends of the second space, the axial length of the second space being equal to the axial length of the first space,

means for transmitting torque from said cylindrical body to said tap holding spindle, said torque transmitting means being coupled to the tap holding spindle so that the tap holding spindle can be axially moved relative to the cylindrical body,

a floating mechanism situated in the first and second spaces of the cylindrical body and the tap holding spindle, said floating mechanism having a first stop ring to abut against the first means of the cylindrical body and the third means



of the tap holding spindle, a second stop ring to abut against the second means of the cylindrical body and the fourth means of the tap holding spindle, the diameter of the second stop ring being radially changeable upon exertion of radial force thereon, and a spring situated between the first and second stop rings, and

means for imparting restricted movement to the second stop ring, said means for imparting restricted movement being formed on one of the inner surface of the cylindrical body and the outer surface of the tap holding spindle so that when the tap holding spindle is urged in the axial direction relative to the cylindrical body, the second stop ring initially engages with and finally passes through the means for imparting restricted movement by changing the diameter of the second stop ring, said second stop ring being smoothly moved after passing the means for imparting restricted movement, whereby when the tap holder is actuated initially, the tap holding spindle can be relatively strongly pushed against a workpiece to allow the tap to bite the workpiece but the tap holding spindle can thereafter be held almost floatingly relative to the cylindrical body.

4,514,116

DRIVE MECHANISM FOR RADIAL ADJUSTMENT OF A DRILLING TOOL

Theo Kaminsky, Pfungstadt, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

PCT No. PCT/DE81/00215, § 371 Date Aug. 6, 1982, § 102(e) Date Aug. 6, 1982, PCT Pub. No. WO82/02011, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 5, 1981, Ser. No. 406,230

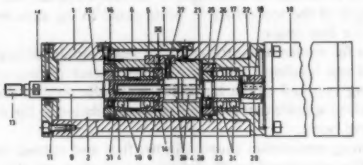
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1980, 3046210

Int. Cl.³ B23B *47/00*

U.S. Cl. 408—161 **1 Claim**

1. In a drive mechanism for effecting radial adjustment of a drilling tool in a drill head, said drive mechanism comprising a housing, a thrust body mounted in said housing for axial sliding movement therein, a first axial bearing carried by said thrust body, a rotatable drive rod rotatably mounted in said first axial bearing for rotation about a longitudinal axis, said drive rod being movable along said longitudinal axis along with said

thrust body between longitudinally inner and outer positions for radially adjusting a drilling tool, a second axial bearing disposed in said housing, a screw shaft mounted in said second bearing for rotation about said longitudinal axis, means preventing longitudinal movement of said screw shaft, said screw shaft including an externally threaded extension extending along said longitudinal axis toward said drive rod, an internally threaded element carried by said thrust body and being non-rotatable relative thereto, said threaded element being thread-



edly mounted on said threaded extension, a drive motor operably connected to said screw shaft to rotate the latter about said longitudinal axis for producing longitudinal movement of said threaded element along said extension to longitudinally move said drive rod, the improvement wherein an end of said drive rod facing said screw shaft has an outer diameter larger than that of said extension and includes a bore disposed in said end, said bore extending along said longitudinal axis in alignment with said extension to telescopingly receive said extension when said drive rod is in its longitudinally inner position.

4,514,117

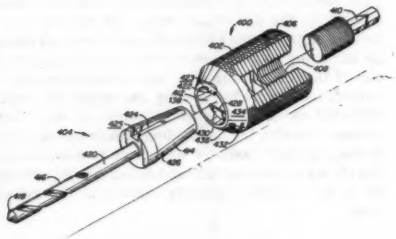
QUICK-CHANGE TOOL HOLDER AND TOOL

Larry Scott, 2821 Eagle Dr., Fort Collins, Colo. 80526

Continuation-in-part of Ser. No. 271,394, Jun. 8, 1981, abandoned. This application May 14, 1982, Ser. No. 377,889

Int. Cl.³ B23B *31/10*

U.S. Cl. 408—239 R **1 Claim**



1. A quick-release rotary tool system for use with rotary drive comprising:

a tool holder having inner and outer ends and an outwardly tapering conical central bore surface defining a central axis;

adaptor means for coupling said tool holder to the rotary drive for rotation of the tool holder about said central axis;

a tool bit assembly including a cutting edge and a base end, said base end having a conical base surface configured for complementary engagement with said central bore surface;

said base surface and said central bore surface including complementary drive surface portions to transmit drive forces between said tool bit assembly and said tool holder, said base surfae of said base end including a recessed portion therein;

quick-release means for axially releasably securing the base end of said tool bit assembly within the central bore defined by said central bore surface, said quick-release means including a latch plate having first and second ends and being pivotally mounted to said tool holder for movement in a radial plane about a pivot pin at said first end between a released position and a locked position, said latch plate positioned so that an inner edge thereof engages the recessed portion of said base end when said base end is substantially fully mounted within said central bore and said latch plate is in said locked position;

means for biasing the inner edge of said latch plate toward said locked position;

said latch plate including an axially extending release pin at said second end of said latch plate; and

said tool holder including a finger recess for providing access to said release pin when said latch plate is in said locked position to allow a user to pivot said latch plate from said latched position toward said released position to allow said tool bit assembly to be removed from said tool holder.

4,514,118

METHOD FOR FABRICATING GEARS

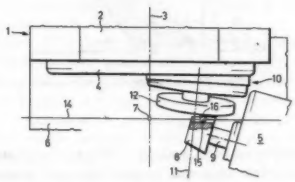
Erich Kotthaus, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Jul. 20, 1981, Ser. No. 285,054

Claims priority, application Switzerland, Aug. 12, 1980, 6092/80

Int. Cl.³ B23F *9/14*

U.S. Cl. 409—26 **11 Claims**



1. In a method of fabricating gears possessing lengthwise crowned teeth by cutting tooth flanks with a cutter head rotating about a cutter head axis and equipped with cutters possessing external cutting edges and internal cutting edges in a continuous gear-cutting operation, wherein the cutters at the cutter head are arranged such that pitch points of the external cutting edges are positioned at a first circle having a first radius and pitch points of the internal cutting edges are positioned at a second circle having a second radius different from the first radius and the external cutting edges are arranged such that each is displaced out of a uniform angular distribution by the amount of a first predetermined angle and the internal cutting edges are arranged such that each is displaced out of the uniform angular distribution by the amount of a second predetermined angle, the improvement comprising the steps of:

pivoting the cutter head axis out of a normal to a tangential plane taken through an operating pitch point of tooth lengthwise line of a pitch surface of a gear and within a vertical plane which is disposed substantially perpendicular to the tangential plane and extends at least approximately parallel to a radius of curvature of the tooth lengthwise line at the operating pitch point; and

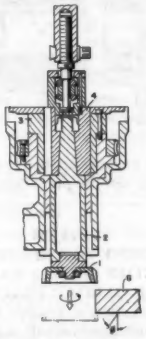
setting at the cutter head the external cutting edges and the internal cutting edges of the cutters such that, during use thereof and upon penetration through the operating pitch point, they each form a respective angle with a normal to the tangential plane, and said normal extending in non-parallel relationship to the cutter head axis.

4,514,119

METHOD OF SHAPING A HELICAL GEAR

Masatoshi Izumo, Kyoto, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,685
Int. Cl.³ B23F 1/08
U.S. Cl. 409—60 4 Claims



3. A method of making a helical gear from a gear blank, with a gear shaper having a cutter spindle movable in a helical guide having a spiral lead of length L in a longitudinal direction, comprising the steps of:

(1) providing on the spindle a pinion cutter having an angle of twist ϕ, a pitch circle diameter d and a module m_n, such that $d=(L/\pi)\cdot\tan\phi$, the quantity

$$Z=\frac{L\cdot\sin\phi}{m_n\cdot\pi}$$

is a non-integer, and the pinion cutter has a number of teeth given by the integer closest and less than Z, the pinion cutter having a circular pitch which is larger than $m_n\cdot\pi$ at one and only one location on its circular periphery and a pitch equal to m_n at all other locations on its circular periphery;

(2) imparting a spiral motion to said spindle along the helical guide while rotating the gear blank such that the teeth of the pinion cutter cuts the periphery of the gear blank; and

(3) interrupting said step of imparting spiral motion to said spindle as the portion of the pinion cutter of circular pitch, larger than $m_n\cdot\pi$, approaches the gear blank, to separate the gear blank and the pinion cutter and increase the speed of the spindle relative to the gear blank until said portion has passed a point of contact with the gear blank, and the resuming said step of imparting spiral motion.

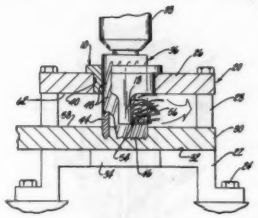
4,514,120

CHIP BREAKER FOR ANNULAR HOLE CUTTING TOOLS

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Filed Apr. 29, 1982, Ser. No. 372,975
Int. Cl.³ B23B 47/34; B23C 9/00
U.S. Cl. 409—137 10 Claims

1. A chip breaking device for use with a rotating annular cutter for forming holes in a workpiece by advancing the cutter through the workpiece, the cutter being of the type having a cylindrical side wall provided with a plurality of cutting teeth spaced circumferentially around the leading end of the cutter and a plurality of helical flutes extending upwardly from said teeth around the outer periphery of the side wall, comprising support means adapted to be positioned in a fixed relation to the workpiece while the cutter is being rotated and advanced axially through the workpiece; a chip breaker fixedly mounted on said support means, said chip breaker including a lug having a leading face and a trailing face extending axially of the cutter and radially to closely adjacent the cylinder of revolution generated by the outer periphery of the cutter side wall, said lug and support means being disposed relative to each other such that one axial end of the lug extends axially to closely adjacent the face of the workpiece in which the hole is to be formed and is spaced axially from said face of the workpiece a distance substantially less than the axial length of said lug, said lug and support means also being disposed relative to each other such that the peripheral zone around the cutter is unobstructed on circumferentially opposite sides of the lug and throughout the axial length of the lug for a circumferential extent substantially greater than the maximum circumferential extent of the lug between said leading and trailing faces, said lug having an axial length substantially greater than the circumferential extent of the lug between said leading and trailing faces, whereby chips cut by the cutter teeth advance axially upstream through the flutes of the rotating cutter, flare radially outwardly into said unobstructed zone as they emerge from the face of the workpiece in which the hole is being cut and impinge against and are severed by said leading face of said lug.

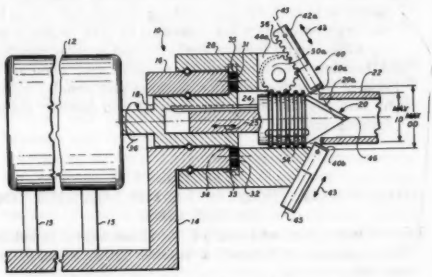


4,514,121

CHAMFERING APPARATUS

Francis J. Fuchs, Jr., 593 104th Ave., Naples, Fla. 33940

Filed Jan. 26, 1983, Ser. No. 461,154
Int. Cl.³ B23C 3/12
U.S. Cl. 409—138 7 Claims



1. Chamfering apparatus for simultaneously chamfering the I.D. and O.D. of the ends of tubular members, comprising:

first chamfering means for chamfering said I.D.;

second chamfering means for chamfering said O.D.; and

mounting means for mounting said first and second chamfering means including means for dependently feeding said first and second chamfering means whereby upon the end of a tubular member first engaging either said first chamfering means or said second chamfering means movement will be imparted to the other of said chamfering means to cause the other chamfering means to engage said end of said tubular member whereby the I.D. and O.D. of the end of said tubular member are simultaneously chamfered and including means for imparting counter rotation to said

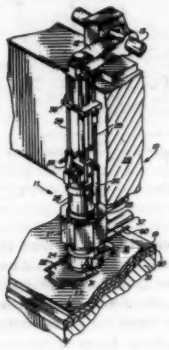
first and second chamfering means to minimize net torque imparted to said tubular members by said simultaneous chamfering.

4,514,122

PRESSURE FOOT FOR MACHINE TOOL

James H. Campbell, 1210 W. Alameda, Suite #108, Tempe, Ariz. 85282

Filed Sep. 30, 1982, Ser. No. 431,318
Int. Cl.³ B23C *9/00*
U.S. Cl. 409—190 **11 Claims**



1. A device for mounting around a spindle assembly of a machine tool for holding a workpiece during a cutting operation comprising:

an open ended cylindrical housing,

said housing defining a chamber for positioning around said spindle assembly and having a projecting annular face at one end thereof for positioning adjacent a workpiece, and

an open ended hollow annular member mounted within said chamber and having one end thereof extending outward of said projecting annular face of said housing,

the outer periphery of said annular member defining a wall having at least one circumscribing slot divided into at least two segments which are separated by web means extending substantially longitudinally of said annular member,

said housing when moved to position said annular face against the workpiece compressing said annular member by laterally distorting the wall of said annular member forming said slot.

4,514,123

ADAPTIVE CONTROL SYSTEM FOR MACHINE TOOL OR THE LIKE

Richard Johnstone, and Edward E. Kirkham, both of Brookfield, Wis., assignors to Kearney & Trecker Corporation, Milwaukee, Wis.

Division of Ser. No. 316,059, Oct. 29, 1981,. This application Nov. 9, 1983, Ser. No. 549,944
Int. Cl.³ B23C *9/00*; F16C *13/00*; F01M *11/10*
U.S. Cl. 409—231 **8 Claims**

1. An apparatus for rotatably supporting a member journaled in a frame by anti-friction bearings which comprises:

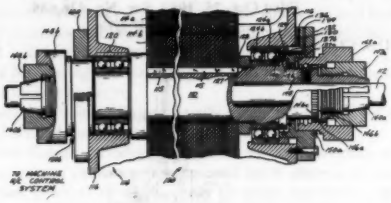
sensing means in position to sense the thrust imposed upon said rotatable member and produce a signal representing the sensed thrust;

pressure means disposed to apply a pressure to said bearings for preloading the bearings;

pressure adjusting means connected to regulate said pressure for varying the preloading of said bearings;

a control connected to receive the signal from said sensing means representing the thrust on a rotatable member; and

means connecting said control to said adjusting means for regulating the operation of said adjusting means in accordance with the signal received from said sensing means so



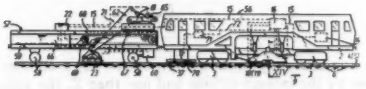
that the preload pressure applied to said bearings is continually adjusted to suit the prevailing conditions.

4,514,124

MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM A RAIL HEAD OF A RAILROAD TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 151,122, May 19, 1980, Pat. No. 4,372,714. This application Oct. 30, 1981, Ser. No. 316,838
Claims priority, application Austria, Jan. 17, 1980, 248/80
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ B23D *1/20*; E01B *31/15*
U.S. Cl. 409—295 **7 Claims**



1. A mobile rail planing maching mounted on a railroad track for continuous movement in an operating direction, the track including two rails each having a rail head defining a gage side, a field side and a running surface, the gage and field sides extending from the running surface to a lower edge of the rail head, the machine being arranged for continuously removing such surface irregularities as ripples, corrugations and overflow metal during the continuous movement and comprising

(a) a frame running on the track on undercarriages having flanged wheels engaging the gage and field sides in a zone adjacent the running surface,

(b) a rail planing tool mounting linked to the machine frame in association with each rail,

(1) the mountings being in substantial alignment in a direction extending transversely to the rails,

(c) transversely extending spacing members linking the mountings to each other,

(d) hydraulic drives for continuously adjusting the spacing members and the mountings linked thereto to the track gage,

(e) hydraulic drive means for vertically adjusting the mountings relative to the running surface of the rail head of the associated rail and for pressing the mountings thereagainst,

(f) guide roller means for vertically and laterally guiding the mountings along the rail heads of the associated rails, the guide roller means including

(1) two guide rollers laterally guiding each mounting without play along a selected one of the sides of the rail head of the associated rail and engaging the selected rail head side in a region extending from the lower edge to below the zone adjacent the running surface, and

(2) a plurality of additional guide rollers vertically guiding each mounting along the running surface of the rail head of the associated rail, the additional guide rollers engaging the running surface and each having an axis extending substantially parallel to the track plane,

(g) a tool head including a tool holder, the tool head being mounted centrally between the guide rollers and for displacement in relation to the mounting in planes parallel to the track plane and to a vertical plane passing through the associated rail and the tool holder including clamping means,

(h) further hydraulic drives connected to each tool head for displacing the same in said planes,

(i) a rail planing tool replaceably mounted in the clamping means of the tool holder, the tool holder detachably carrying

(1) a cutting blade having a cutting edge for planing chips or shavings off the rail head to obtain a selected rail head configuration, and

(j) means for removing the chips or shavings.

4,514,125

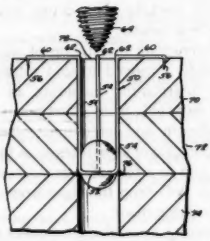
FASTENER IMPROVEMENT INCLUDING INTRODUCTION OF SELECTED CAPSULE OF ADHESIVE INTO POROUS BASKET HUNG IN BORE FOR ACTIVATION BY FASTENER INSTALLATION

Israel Stol, Monroeville, Pa., assignor to Invocas, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 359,894, Mar. 19, 1982, abandoned. This application Jul. 14, 1982, Ser. No. 398,448

Int. Cl.³ F16B *39/02*

U.S. Cl. 411—82 **12 Claims**



1. A fastener improvement, comprising:

material to be fastened, having means defining a bore therein through a face thereof, said bore having a mouth, an axially extending peripheral sidewall and an inner end;

a fastener having a shank with a tip end and a head, the fastener being adapted to have the tip end and shank thereof received in said bore through said mouth;

a basket for adhesive capsule means including floor means for supporting adhesive capsule means, and means for disposing the floor means at a selected intermediate level in said bore substantially before said inner end; and

adhesive capsule means including at least one thin-walled jacket encapsulating a respective quantum of adhesive, each such capsule being adapted to be received in the bore and supported upon said floor means ahead of the tip end of said fastener and to have the jacket thereof ruptured by compressive engagement between the fastener tip end and the floor means of said basket so as to spread said adhesive into the interfacial fastening region that is defined between said fastener shank and said material within said bore;

said floor means disposing means said basket include tab means for externally engaging said material about the perimeter of said bore mouth, and connector means extending axially between said floor means and said tab means; and

said connector means and tab means being provided as a plurality of respective leg members each having a connector means portion integrally joined to a tab means portion.

4,514,126

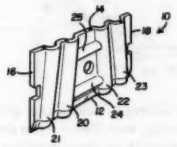
CORRUGATED STAPLE

James Knowles, 1275 Club Dr., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 113,370, Jan. 18, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,165

Int. Cl.³ E04C *3/12, 3/292*

U.S. Cl. 411—477 **3 Claims**



1. An improved metal staple of the type used for securing together pieces of wood in an abutting relationship, said staple being generally flat and rectangular and having a leading edge and a trailing edge, said leading edge defined as the edge which is inserted into the pieces of wood, said staple further having opposed sides the improvement comprising:

first corrugation means extending from the leading edge to said trailing edge, said first corrugation means including two parallel spaced apart corrugations which are generally semi-circular in cross-section, each of said corrugations of said first corrugation means having a longitudinal axis oriented at an acute angle relative to said leading edge;

second corrugation means extending from said leading edge to said trailing edge, said second corrugation means including two parallel spaced apart corrugations which are generally semi-circular in cross-section, each of said corrugations of said second corrugation means having a longitudinal axis oriented at an acute angle relative to the leading edge of said staple;

the longitudinal axes of the corrugations of said second corrugation means intersecting the longitudinal axes of the corrugations of said first corrugation means; and

third corrugation means wherein said third corrugation means includes upper and lower spaced apart parallel corrugations which are generally semi-circular in cross-section, said upper and lower corrugations extending between and interconnecting a corrugation of said first corrugation means and a corrugation of said second corrugation means, the longitudinal axis of said upper corrugation being adjacent to said trailing edge and the longitudinal axis of said lower corrugation being adjacent to said leading edge, said upper corrugation being shorter than said lower corrugation, and the longitudinal axes of said upper and lower corrugations being parallel to said leading edge, and wherein all of said corrugations are formed on the same surface of said staple.

4,514,127

ROUND BALE UNROLLER

Joseph W. Maier, Box 93, Paradise Hill, Saskatchewan, Canada S0M 2G0

Filed Jul. 22, 1983, Ser. No. 515,994

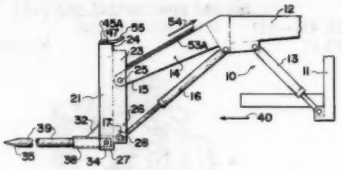
Claims priority, application Canada, Jan. 6, 1982, 393648

Int. Cl.³ A01D *87/12*

U.S. Cl. 414—24.6 **19 Claims**

1. A round bale unrolling device for attachment to a fork lift mechanism on a tractor or the like; comprising in combination a substantially rectangular frame, means on the rear side of said frame operatively mounting said frame to the fork lift mecha-

nism for raising and lowering the frame and tilting said frame around a substantially horizontal mounting axis, at least one round bale axis engaging member extending from adjacent the base of said frame and means mounting said member by the inner end thereof for pivotal movement from a forwardly extending position from said frame to a sideways extending position substantially 90° from said forward position position



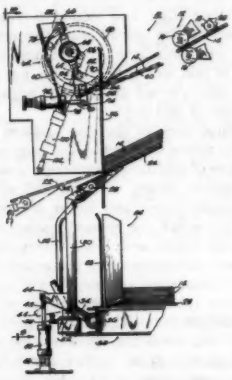
and vice versa, the tilting of said frame around a substantially horizontal axis, moving said frame from an upwardly inclined position to a downwardly inclined position and vice versa, the tilting of said frame fromthe upwardly inclined position to the downwardly inclined position, swinging said round bale engaging member from the sideways extending position to the forwardly extending position, by gravity.

4,514,128

SIGNATURE STACKER INCLUDING IMPROVED INTERCEPT MEANS

Robert Hedrick, Elm Grove, Wis., assignor to Mailroom Systems, Inc., Germantown, Wis.

Filed Jul. 12, 1982, Ser. No. 397,103
Int. Cl.³ B65H *31/30, 31/32*
U.S. Cl. 414—49 **23 Claims**



1. A signature stacker for forming bundles containing a preselected number of signatures from an incoming stream of signatures delivered to the stacker, the signature stacker comprising a frame, an infeed conveyor means for receiving the signature stream, a bundle outfeed means, a stacking blade assembly positioned below said infeed conveyor means and for receiving a preselected number of signatures from said infeed conveyor means and for forming a bundle of signatures, said stacking blade assembly being moveable between a stacking position wherein said stacking blade assembly can receive signatures and a retracted position wherein said bundle is dropped onto said bundle outfeed means, and an interceptor blade assembly positioned between said infeed conveyor means and said stacking blade assembly, said interceptor blade assembly including a first blade assembly having a first interceptor blade and a second blade assembly having a second interceptor blade, and said interceptor blade assembly including means for supporting said first blade assembly and said second blade assembly for selective rotational indexing movement around a horizontal axis, one of said blade assemblies being supported on one side of said horizontal axis in a first position and the other of said blade assemblies being supported on an opposite side of said horizontal axis in a second position, and means for causing indexing rotation of said interceptor blade assembly around said horizontal axis in a single rotational direction, said means for causing indexing rotation including a lever arm connected to said interceptor blade assembly and a fluid cylinder assembly including a first fluid cylinder housing a first extensible piston and a second fluid cylinder housing a second extensible piston, said first fluid cylinder and said second fluid cylinder being fixed together in linearly aligned relation, said fluid cylinder assembly being connected to said lever arm to cause indexing rotation of said lever arm around said horizontal axis.

17. A signature stacker for forming bundles containing a selected number of signatures from an incoming stream of signatures delivered to the signature stacker, the signature stacker comprising:

a frame,

an infeed conveyor means for receiving the signature stream,

a bundle outfeed means,

a stacking blade assembly positioned below said infeed conveyor means and for receiving a selected number of signatures from said infeed conveyor means and for forming a bundle of signatures, said stacking blade assembly including at least one stacking blade adapted to support the bundle of signatures, and means for supporting said stacking blade for movement from a first position over said bundle outfeed means and wherein said stacking blade supports signatures thereon and a retracted position wherein said stacking blade drops said bundle onto said bundle outfeed means,

means for interrupting the stream of signatures when said stacking blade is moved to said retracted position, said means for interrupting including an interceptor blade selectively moveable from a first position, to an intercept position wherein said interceptor blade moves into the path of said stream of signatures so as to support a stack of signatures, and to a retracted position wherein said interceptor blade will drop the signatures supported thereon onto said stacking blade,

means for counting a preselected number of signatures passing through said infeed conveyor means and for causing said stacking blade to move from said stacking position to said retracted position and said interceptor blade to move from said first position to said intercept position,

means for causing said stacking blade to return to said stacking position as soon as said stacking blade reaches said retracted position,

and means for causing said interceptor blade to move to said retracted position as soon as said stacking blade approaches said stacking position and before said stacking blade reaches said stacking position,

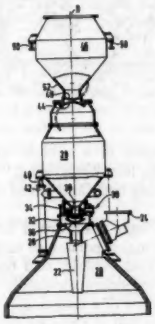
and said means for interrupting the stream of signatures including an interceptor blade assembly positioned between said infeed conveyor means and said stacking blade assembly, said interceptor blade assembly including a first blade assembly having a first interceptor blade and a second blade assembly having a second interceptor blade, each of said interceptor blades having a blade tip, and said interceptor blade assembly including means for supporting said first blade assembly and said second blade assembly for selective rotational indexing movement around a horizontal axis, one of said blade assemblies being supported on one side of said horizontal axis in a first position and, the other of said blade assemblies being supported on an opposite side of said horizontal axis in a retracted position.

4,514,129

FURNACE CHARGING INSTALLATION

Edouard Legille, Luxembourg; Pierre Mailliet, Howald, and Emile Lonardi, Bascharage, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Mar. 8, 1982, Ser. No. 355,531
Claims priority, application Luxembourg, Apr. 3, 1981, 83279
Int. Cl.³ F23K 3/06
U.S. Cl. 414—200 21 Claims



1. A charging installation for a pressurized furnace, the furnace having an axis and an internal distributor which has its receiving end aligned with the said axis, the furnace further having a charge material supply opening which is coaxial with said axis, said charging installation comprising:

an intermediate charge material storage vessel, said vessel having an axis, said vessel further having a discharge opening at its lower end and a loading opening in its upper end, said discharge opening being coaxial with said vessel;

means supporting said vessel above and coaxially with the furnace; and

means for coupling said vessel discharge opening to the furnace to selectively establish a flow of charge material from the said vessel to the receiving end of the furnace distributor, said coupling means including flow control means, said flow control means defining a variable area orifice which is generally symmetrical with respect to a prolongation of the furnace axis, said flow control means comprising:

a pair of registers, said registers each having the shape of a segment of a sphere, said registers each also being provided with a cut-out extending inwardly from an edge thereof;

means supporting said registers for rotation about a common axis; and

means for simultaneously imparting rotation in opposite directions about said axis to said registers whereby said cut-out portions of said registers may be placed in registration, said registered cut-out portions of said registers defining said variable area orifice;

said means supporting said registers for rotation comprising:

a common support shaft positioned to one side of a prolongation of said vessel discharge opening; and

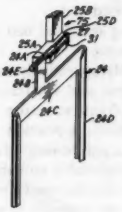
a pair of coaxial, rotatable support shafts positioned at the opposite side of said vessel discharge opening prolongation with respect to said common shaft, said coaxial shafts being coupled to respective of said registers and being rotatable relative to one another, said common and coaxial support shafts defining said common axis.

4,514,130

SUBSTRATE ELEVATOR MECHANISMS

Gary W. Gladish, Buck Creek Township, Hancock County, Ind., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,376
Int. Cl.³ B65G 25/00, 65/02
U.S. Cl. 414—416 8 Claims



1. An elevator mechanism for vertically transferring substrates between radial open-topped slots in a lower rotatable magazine and locations assigned to such substrates at the sides of an upper polygonal rotatable cage, said slots and locations being adapted by respective stepwise rotations of said magazine and cage about respective vertical axes therefor to be horizontally indexed transversely and laterally, respectively, past lower and upper transfer stations, respectively, and said mechanism comprising, a tray adapted to be transferred between said slots and locations and which comprises: a vertically oriented frame for receiving and holding at least one of said substrates, said frame having a center plane which is vertically and laterally oriented, a vertical lug joined to the top of said frame nearer to one of its vertical sides than the other and projecting upwards from said frame, and a horizontal rod joined to said lug on one side thereof adjacent its top in vertical spaced relation from said frame, said rod being parallel to said plane of said frame, and said rod providing as part thereof a tab for such tray, such tray tab being laterally and transversely offset from said lug and being on its underside of cylindrical form and said mechanism further comprising, a hook comprising a vertical stem and a horizontal elevator bar joined to said stem on one side thereof adjacent its bottom, such bar providing as part thereof an elevator tab horizontally salient from said stem in the direction opposite the salient direction of said tray tab from said lug, said elevator tab having an upper side laterally and transversely offset from said stem and having formed in such upper side a horizontally extending cylindrical groove disposed parallel to the plane of said frame and adapted to receive and engage with the underside of said tray tab so as to provide an areal contact bearing surface therefor, and such mechanism also comprising endless belt conveyor means to which the upper end of said hook is coupled, said conveyor means being adapted upon engagement of such tray tab's underside with the groove of such elevator tab to convey said tray between said station for purposes of transferring it and any associated substrate between said slots and said cage locations.

4,514,131

AUTOMATIC SELF-LOCKING ROLL BACK CARRIER FOR A VEHICLE

James P. Godwin, Sr., Rte. 5, Box 8, Dunn, N.C. 28334

Filed Jan. 10, 1983, Ser. No. 456,568
Int. Cl.³ B60P 1/00
U.S. Cl. 414—480 3 Claims

1. An automatic self-locking roll back tiltable load carrier adapted to be mounted on a vehicle comprising:

A. a sub-frame structure;

B. a lift frame movably mounted to said sub-frame structure and movable between a generally horizontal transport position and an inclined loading position;

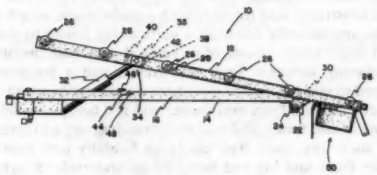
C. means associated with said lift frame and said sub-frame

structure for moving said lift frame between said transport and loading position;

D. a load bed movably mounted on said lift frame and movable back and forth thereon from a transport position to a loading position wherein in said loading position said load bed extends to a surface underlying and supporting the vehicle having said roll back carrier mounted thereon whereby a load such as a vehicle can be conveniently moved onto said load bed;

E. means for moving said load bed between said transport and loading positions;

F. a latching assembly operatively associated with said sub-frame structure and said lift frame for locking said lift frame to said sub-frame structure when said lift frame is disposed in the transport position, said latching assembly including a latch structure secured to said sub-frame structure; a locking bar assembly movably mounted within said lift frame and movable between a locked position in which case said locking bar assembly is engaged with said latch structure and a lifting position, said locking bar assembly comprising an elongated locking bar with a pair of laterally spaced lifting plates secured thereto with said locking bar and lifting plates being movable together within said lifting frame between said locked and lifting positions; a pair of laterally spaced lifting stops secured to said lift frame and disposed in the path of travel of said lifting plates as the same are moved between said locked and



lifting positions with said lifting stops being spaced from said lifting plates when the locking bar assembly assumes said locked position and wherein said lifting stops actually engage said lifting plates when said locking bar assembly assumes said lifting position; and a locking and lifting hydraulic cylinder interconnected between said sub-frame and said locking bar for moving said locking bar assembly from said locked position to said lifting position wherein in the lifting position said lifting plates of said locking bar assembly actually engage said lifting stops on said lift frame for continuing to move said locking bar and the lifting plates thereof against said lifting stops to raise said lift frame from said horizontal transport position to said inclined loading position, said locking and lifting hydraulic cylinder further functioning to both lower said lift frame and to lock the same to said sub-frame via said latching assembly by moving said locking bar back downwardly towards said sub-frame where said lifting plates separate from said lifting stops in response to said lift frame reaching its horizontal transport position and being supported by said sub-frame after which said transverse locking bar is pulled into a locked position within said latch structure secured to said sub-frame by said same hydraulic cylinder, whereby said hydraulic cylinder functions to both lock and unlock said lift frame to said sub-frame and to raise and lower said lift frame relative to said sub-frame.

4,514,132

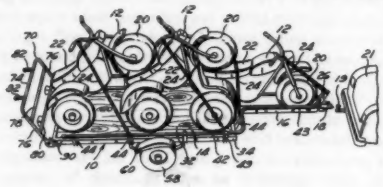
TRAILER WITH RAMP

Denny B. Law, San Marcos, and Bernhardt P. Goettker, Escondido, both of Calif., assignors to Unique Functional Products, San Marcos, Calif.

Filed Feb. 28, 1983, Ser. No. 470,230

Int. Cl.³ B60P 3/07

U.S. Cl. 414—537 **20 Claims**



1. The improvement in a vehicle to carry motorcycles, three-wheelers or the like, comprising:

(a) a load-supporting body and wheel means supporting said body,

(b) said body having a main broad flat platform extending throughout the major portion of said body and extending to the rear of said vehicle, said body having a narrow track member extending forwardly from said main platform in the manner of a tongue and having a ball coupler to connect to the ball of a towing vehicle so that said track member serves the function of a tongue, said platform being at least several times wider than said track member,

(c) said track member having a single beam forming a track operative to support forward of said platform only a single wheel of a motorcycle, three-wheeler or the like in transportation and during loading onto and off of said track member, said track member having a bow member at its forward end extending in an oblique plane forwardly as it extends upwardly, said ball coupler adjustably securing to said bow member lengthwise of said bow member so as to adjust for the height of the ball of a towing vehicle,

(d) said platform being formed from plywood and a metal rectangular frame therearound secured to said plywood and lateral supports under said plywood secured to said frame,

(e) on each side of said body a continuous tubular retainer supported on bracket means and by said bow member and extending forwardly along the side of said platform and bending around the platform front edge and then bending along the side of said truck member, said retainer being disposed in a plane parallel to and spaced above the plane of said platform and in plan view outlying the borders of said platform and track member, strap securing means spaced along the length of said tubular retainer for securing of one end of tie-down straps having their other ends secured to said motorcycles, three-wheelers or the like, and

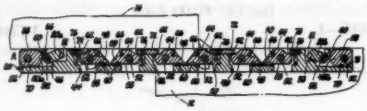
(f) a loading ramp having a first tube of U-shape with a long base portion and shorter arm portions and connecting means pivotally connecting the end of each arm position to opposite rear portions of said platform, at least a second tube juxtaposed to and spaced from said base portion and secured to said arm portions medially thereof, and leg means on said base portion of said first tube on the side away from the pivotal connection thereof operative to rest on the ground when the ramp is lowered whereby said leg means spaces said base portion from the ground and whereby motorcycles, three-wheelers and the like can be loaded onto and unloaded from the vehicle by contacting successively, in loading, the ground, said base portion, said second tube and the rear portion of said platform and by contacting successively, in unloading, the rear portion of said platform, said second tube, said base portion, and the ground, the tubes of said rump being uncovered so that they are the direct load carrying ramp members.

4,514,133

DIE ENGAGING BLOCK FOR A DIE CHANGE TRUCK

Oscar D. Vercruysse, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1983, Ser. No. 522,981
Int. Cl.³ B66F 9/19
U.S. Cl. 414—512 2 Claims



1. In a die change truck or the like of the type having a substantially planar, horizontal bed for supporting a die to be pulled from or pushed onto the bed of a press located to either side of the truck bed, and having at least one elongated powered member extendible and retractible relative to either side of the truck bed with a stroke less than the width of a die to be changed so that the die must be moved by the powered member in successive stroke stages, an improved means for selectively engaging and disengaging the powered member with the die comprising:

a plurality of first pusher-puller blocks spaced along the length of the powered member and mounted thereto for movement between a stored position not above the plane of the truck bed and an operative position extending above the plane to engage a die,

a plurality of second pusher-puller blocks spaced along the length of the powered member and interspersed with the first blocks and mounted to the powered member for movement between a stored position not above the plane of the truck bed and an operative position extending above the plane to engage a die,

first stop means engageable between each first pusher-puller block and the powered member to prevent movement out of the operative position so that each first block in its operative position may pull a die from a press bed on one side of the truck bed or push a die toward a press bed on the other side of the truck bed,

and second stop means engageable between each second pusher-puller block and the powered member to prevent movement out of the operative position, so that each second block in its operative position may pull a die from a press bed on the said other side of the truck bed or push a die toward a press bed on the said one side of the truck bed, the first and second stop means being disengageable from its respective block to allow free rotation of said blocks back to stored position,

the cooperation of a selected one of said plurality of interspersed first and second pusher-puller blocks with a respective one of said first and second stop means providing a rapid means for engaging, disengaging and re-engaging a die with the powered member at any given relative position of the die and the powered member as the powered member extends or retracts so that the die may be more quickly changed.

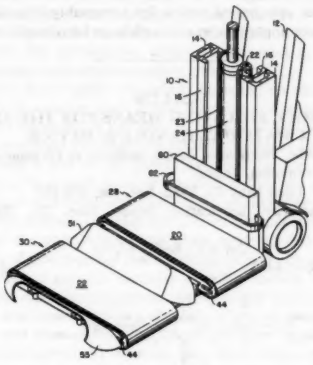
4,514,134

DOUBLE SIDEWINDER

Samuel M. Frye, Joanna, and James O. Singleton, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 18, 1983, Ser. No. 467,769
Int. Cl.³ B66F 9/14
U.S. Cl. 414—659 1 Claim

1. A load handling vehicle of the lift truck type having a substantially vertical mast and a vertically moveable lift fork extending horizontally from said vertical mast and being connected thereto, the improvement comprising: a pair of conveying systems mounted on said lift fork, each of said conveying systems having a conveyor belt, said conveyor belts being spaced from one another and being moveable in either direction independent of the movement of the other, deflection means mounted between said conveyor belts to guide a load



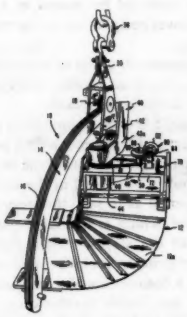
onto one or the other of said conveyor belts and a control means operated with said conveying system to control the independent movement of each of the conveyor belts and the independent rotation of each of said belts.

4,514,135

APPARATUS FOR TRANSPORTING AND ARTICULATING AN ARTICLE

J. Weldon Cade, Orange, and Stanley I. Stein, La Mirada, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 13, 1983, Ser. No. 513,540
Int. Cl.³ B66F 9/00
U.S. Cl. 414—682 6 Claims



1. Transport apparatus for transporting and articulating an article into and out of a housing, comprising:

a lifting beam having moving means mounted thereon;

a lifting assembly including means for connection to a hoist and a first drive assembly for driving said lifting assembly relative to said moving means and said lifting beam so as to rotate said article about a first axis;

rotational means connected to one end of said lifting beam and including driven sprocket means and a shaft member rotatable relative to said lifting beam; and support means connected to said one end of said lifting beam, said support means including an L-shaped bracket through which said shaft member extends, to be rotatably connected to

said support means, said driven sprocket means rotating said shaft member relative to said support means;

a second drive assembly including a sprocket and chain for driving said driven sprocket means and shaft member so as to rotate said article relative to said lifting beam and about a second axis; and

removable attachment means for removably attaching said transport apparatus to said article to be transported.

4,514,136

PIVOT ANGLE ADJUSTING MEANS FOR THE ARM OF A MATERIAL HANDLING DEVICE

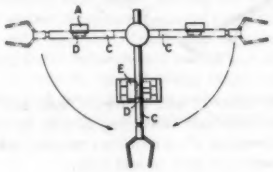
Masatoshi Abe, Yokohama, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed May 17, 1982, Ser. No. 379,151

Claims priority, application Japan, Dec. 25, 1981, 56-197453[U]

Int. Cl.³ B65G *47/90*

U.S. Cl. 414—744 A **5 Claims**



1. Pivot angle adjusting means for the arm of a material handling device comprising:

(a) an arm mount for holding an arm;

(b) a support which supports the arm mount;

(c) a rotary shaft which is rotatably mounted to the support,

(d) a cylindrical vane chamber having a rotary vane, mounted to the support, in which the rotary vane secured to the rotary shaft is adapted to be pivoted by a fluid supplied to the cylindrical vane chamber;

(e) a stopper mounted by means of a spur wheel having upper and lower peripheries, to the rotary shaft below said rotary vane;

(f) a pair of sensors mounted to the support, and which are actuated by a pair of further stoppers for detecting the pivot angle of the rotary shaft;

(g) a stop having a U-shaped mounting piece being mounted to the support and being movable a certain distance in the direction of the movement of the stopper, and said stop being adapted to be placed in the locus of the movement of the stopper so as to stop the stopper at a certain intermediate point which is the same point within the pivot movement of the stopper when the stopper is pivoted clockwise or counterclockwise; said stop being adapted to be movable a distance equal to the sum of the thickness of the stopper and double the thickness of said stop; and

(h) and wherein said stopper comprises a mount piece of substantially U-shaped cross section, and having end bent upwardly and downwardly so as to engage in a periphery of flanges formed in said upper and lower peripheries of said spur wheel, a toothed piece having teeth engageable with teeth of said spur wheel in its inner end and having a tapered outer end surface facing a lower skew or slant, a wedge piece positioned between said toothed piece and the outer end of said mount piece, having a tapered inner end surface which faces an upper skew or slant and contacts with said tapered outer end surface of said toothed piece, and adjustable screw means mounted to the lower part of said mount piece, for pushing up on the bottom of said wedge piece.

4,514,137

METHOD FOR DRIVING TWO-PHASE TURBINES WITH ENHANCED EFFICIENCY

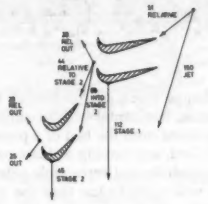
David G. Elliott, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 161,257, Jun. 20, 1980, abandoned.

This application Sep. 30, 1982, Ser. No. 431,420

Int. Cl.³ F01D *1/04*

U.S. Cl. 415—1 **3 Claims**



1. An improved method of driving a two-phase fluid turbine having at least a first and second stage of bladed rotors sequentially receiving the two-phase fluid to extract kinetic energy for driving an output shaft through a gear box connecting the respective rotors and the output shaft, comprising the steps of:

(a) introducing into the first stage bladed rotor, at a predetermined linear flow velocity, a flow of the two-phase fluid;

(b) causing the two-phase fluid to pass through the first and second stages so that the stages rotate in the same direction;

(c) maintaining the tangential velocity of the first stage bladed rotor tips at a velocity greater than fifty percent of the predetermined linear flow velocity entering the first stage;

(d) maintaining the tangential velocity of the second stage rotor blade tips at a fixed ratio of about fifty percent of the tangential velocity of the first stage bladed rotor; and

(d) exhausting the two-phase fluid from the second stage whereby a power efficiency of at least two-thirds is extracted from the kinetic energy of the two-phase fluid introduced into the first stage.

4,514,138

LEAKAGE WATER DISCHARGE METHOD AND APPARATUS IN A REVERSIBLE HYDRAULIC MACHINE

Taizo Inagaki, Yokohama; Kentaro Ichikawa, Chigasaki; Hitoshi Kido, and Yozo Kawase, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 24, 1983, Ser. No. 469,271

Claims priority, application Japan, Feb. 26, 1982, 57-30208

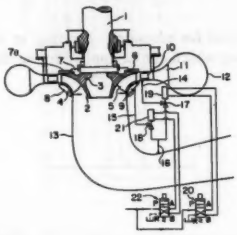
Int. Cl.³ F03B *15/04*

U.S. Cl. 415—1 **1 Claim**

1. A method of discharging water leaking past a plurality of guide vanes of a reversible hydraulic machine when the plurality of guide vanes are closed and a runner chamber in said hydraulic machine has been provided with compressed air to depress a water level within said runner chamber, the reversible hydraulic machine having a runner, the runner adapted to rotate in one of a first direction and a second direction opposite to the first direction, and having a plurality of curved runner blades, each runner blade having a concave face which leads the runner blade when the runner rotates in the first direction, and a convex face which leads the runner blade when the runner blade rotates in the second direction, a first cover disposed above the runner, a second cover disposed below the runner, said runner chamber being defined between said runner

and one of said first and second covers, a draft tube disposed adjacent and below the runner, first discharge means connected to the runner and to the draft tube for discharging water from the runner chamber to the draft tube when the first discharge means is open, second discharge means connected to the runner chamber and to the draft tube for discharging water from the runner chamber to the draft tube when the second discharge means is open, the plurality of guide vanes being disposed radially outward of the runner, comprising the steps of:

opening both of the first and second discharge means to maintain a water film of predetermined thickness on said



inner surfaces of said guide vanes when the runner is rotating in the first direction; and

opening only one of the first and second discharge means to maintain said water film of predetermined thickness on said inner surfaces of said guide vanes when the runner is rotating in the second direction;

thereby to maintain said water film of predetermined thickness on said inner surfaces of said guide vanes regardless to direction of rotation of said runner, so as to substantially seal said compressed air within said runner chamber without overheating or unnecessarily dissipating the rotational kinetic energy of said runner.

4,514,139

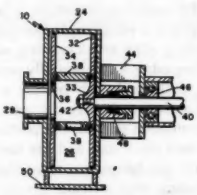
METHOD AND APPARATUS FOR PUMPING FRAGILE ARTICLES

Max I. Gurth, 1937 Dehesa Rd., El Cajon, Calif. 92020

Continuation of Ser. No. 352,160, Feb. 25, 1982, abandoned, which is a continuation of Ser. No. 166,186, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 938,224, Aug. 30, 1978, abandoned. This application Feb. 17, 1983, Ser. No. 467,457

Int. Cl.³ F01D *1/36*

U.S. Cl. 415—90 **4 Claims**



1. A rotary disc incompressible liquid pump for pumping an incompressible liquid medium, said pump comprising in combination:

a housing having a pair of circular end walls disposed in spaced apart parallel planes and connected together by a peripheral wall defining a rotor chamber having a constant radius at any selected plane parallel to and between said parallel planes;

one of said end walls having means defining an inlet opening co-axially of said chamber;

said peripheral wall having tubular means defining an outlet communicating with said rotor chamber and extending outwardly from said housing in a direction parallel to and between said parallel planes at a tangent to the housing walls at the outer diameter of said chamber;

an impeller shaft rotatably mounted in the other of said end walls and terminating with an inner end in said rotor chamber adjacent said other end wall;

a rotary disc impeller co-axially mounted on said inner end of said impeller shaft in said chamber for rotation therein and comprising a plurality of circular co-axially disposed discs spaced a predetermined distance apart and each disc having a pair of oppositely disposed parallel continuous planar faces and an outer diameter defined by a peripheral edge that is a uniform distance no greater than ten percent of the diameter of said discs from said peripheral wall of said chamber, one of said discs mounted directly on the end of said impeller shaft, another of said plurality of discs having a co-axial circular opening therein defining an inner diameter no greater than one-half said outer diameter and connected by a plurality of spacer pins to said one of said discs at the edge of said circular opening; and

said predetermined distance said discs being spaced apart being no greater than the outer diameter of said discs sufficient to permit the unobstructed passage of articles of a predetermined size having no dimension greater than said predetermined distance in liquid from said inlet through said co-axial circular opening and between said discs to the outlet.

4,514,140

AXIAL FAN

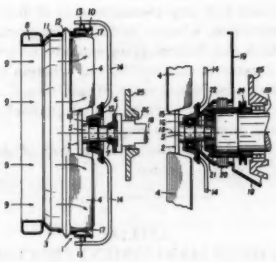
Franz Knopf, Graz, Austria, assignor to Hans List, Graz, Austria

Continuation of Ser. No. 288,809, Jul. 31, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 550,178

Claims priority, application Austria, Aug. 5, 1980, 4047/80

Int. Cl.³ F04D *29/66*

U.S. Cl. 415—119 **1 Claim**



1. An air duct housing for an axial fan having impeller blades mounted on the drive shaft of a water-cooled internal combustion engine mounted on a support and having a cooling radiator, comprising an annular fan guard surrounding the tips of said blades and defining therewith a narrow annular gap in the range of 2 to 5 mm, a roller bearing on said shaft and lying outwardly of the engine, a mounting plate supported on said bearing independently of the engine support and independently of the engine, radial arms spaced from and unattached to the engine and interconnecting said fan guard with said mounting plate for centering said fan guard on the fan axis and for isolating any engine movement from said fan guard to thereby maintain said narrow annular gap, the housing further comprising an annular part rigidly connected to the engine radiator, means interconnecting said fan guard with said annular part for preventing rotation of said fan guard relative to said

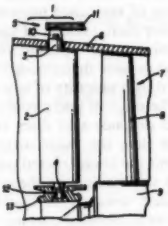
drive shaft, and a sound-insulated housing surrounding the engine with a portion of said sound-insulated housing lying within the space between said arms and the engine, whereby any noise sounds emanating from the engine are not transmitted outwardly of said sound-insulated housing via said radial arms.

4,514,141

SAFETY STOP FOR A VARIABLE SETTING STATOR BLADE PIVOT

Daniel J. Marey, Paris, France, assignor to S.N.E.C.M.A., Paris, France

Filed Apr. 7, 1983, Ser. No. 482,940
Claims priority, application France, Apr. 8, 1982, 82 06117
Int. Cl.³ F01B *25/02*
U.S. Cl. 415—160 **5 Claims**



1. A safety stop for a variable setting stator vane, said vane having top and bottom pivots, said top pivot being monitored by blade orientation means, said bottom pivot being set in a bearing of a stator ring, said safety stop comprising:

a cam arm having at least one cam portion;

means for securing said cam arm onto said bottom pivot;

stop elements associated with said stator ring, said cam arm and stop elements being constructed and arranged such that said rotation of said stator vane beyond a predetermined angular range causes contact between said cam portion and said stop elements so as to limit rotation of said stator blade, wherein said stator ring includes a recess into which said bottom pivot extends, wherein said cam arm is located in said recess, and wherein said stop elements comprise lateral walls of said recess, wherein said recess comprises a circumferential channel in a radially inner wall of said stator ring; and

an element fixed to said radially inner wall of said stator ring and covering said channel.

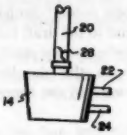
4,514,142

POWER MANAGEMENT PROCESS

Harvey R. Young, Williamsburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 364,573, Apr. 1, 1982, Pat. No. 4,488,851. This application Dec. 12, 1983, Ser. No. 560,366
Int. Cl.³ B64C *11/46*
U.S. Cl. 416—1 **1 Claim**

1. In the operation of a helicopter engine wherein operating conditions change power demands, such as wherein under flight conditions an increase in rotor blade pitch causes a demand for increased engine power, a process for making excess power available for a thrusting device of the helicopter when no such demand for increased power is made, comprising generating a first signal which is proportional to the total amount of engine power available, continuously sensing the amount of engine power utilized under the flight conditions, generating a second signal proportional to the amount of excess power remaining for the thrusting device, and utilizing



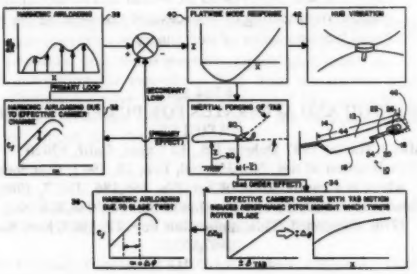
said second signal for physically limiting to that excess the amount of power which can be applied to the thrusting device.

4,514,143

AIRCRAFT ROTOR BLADE WITH PASSIVE TUNED TAB

Thomas G. Campbell, Cheshire, Conn., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 28, 1983, Ser. No. 489,675
Int. Cl.³ B64C *13/00*
U.S. Cl. 416—23 **5 Claims**



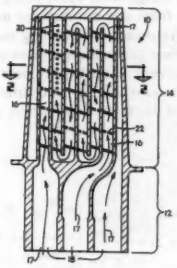
1. A structure for reducing vibratory airloading in a rotor blade which comprises a rotor blade having an airfoil cross-section with a leading edge and a trailing edge and a cut-out portion at the trailing edge, a substantially wedge shaped cross-section, inertially deflectable tab having a leading edge, a trailing edge, and a pivot axis near the leading edge, said tab being pivotally mounted in said cut-out portion so that said tab may rotate about said pivot axis and the trailing edge of said tab may move above and below said rotor blade, weight means secured to the leading edge of said tab for maintaining the center of gravity of said tab and weight means between said pivot axis and said blade leading edge, a torsion bar biasing means connected between said rotor blade and said tab for applying force against said tab when the trailing edge of said tab is above and below said rotor blade, said biasing means including a torsion bar and a torsion bar restraining member slidably movable along said torsion bar to vary the torsional biasing force supplied by said torsion bar to said tab.

4,514,144

ANGLED TURBULENCE PROMOTER

Ching-Pang Lee, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 506,156, Jun. 20, 1983, abandoned. This application Nov. 7, 1983, Ser. No. 549,219
Int. Cl.³ F01D 5/18
U.S. Cl. 416—96 R 8 Claims



1. A turbine blade with at least one internal cooling passage, said passage including first and second opposite walls, and a plurality of first and second turbulence promoting ribs, wherein:

said first ribs are integral with said first wall of said passge and disposed at a first angle with respect to the center line of said first wall;

said second ribs are integral with said second wall of said passage and disposed at a second angle with respect to the center line of said second wall; and

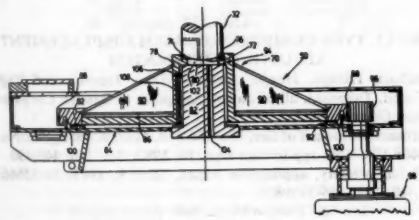
each of said first and second ribs comprises two rib members separated by a turbulence promoting gap.

4,514,145

GEAR BOX ASSEMBLY

Charles F. Wood, 3141 Given St., Mississauga, Ontario, Canada

Filed Dec. 21, 1981, Ser. No. 332,859
Int. Cl.³ F03D 11/02
U.S. Cl. 416—170 R 36 Claims



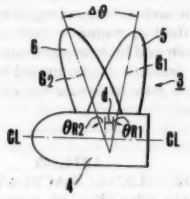
1. A vertical axis wind turbine having a rotor having a centrally disposed axis or rotor shaft oriented in the vertical direction, and an improved hydraulic suspension system for supporting the rotor shaft of the vertical axis wind turbine, the improvement comprising the rotor shaft having a bottom surface sitting on a spherical bearing surface and supported for angular rotation by the bearing surface and hydraulic fluid presented under pressure to a space directly below, and in communication with the bottom surface for providing radial and vertical support, respectively.

4,514,146

PROPELLER FOR SHIP

Takeo Nojiri, Kamakura, and Yasuo Irie, Yokohama, both of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 436,988
Int. Cl.³ B63H 1/20
U.S. Cl. 416—200 R 6 Claims



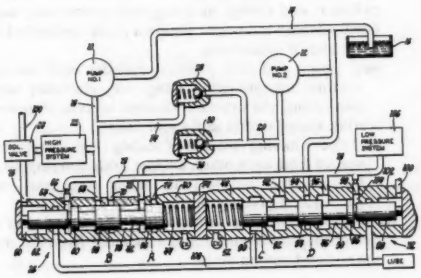
1. A propeller for use in a ship comprising a plurality of pairs of blades having axially overlapping roots anchored to a common hub, at least one of two adjacent blades being inclined forwardly or rearwardly so as to make different the rake angles of the two adjacent blades, and the pitch angle of a rearward blade being made larger than that of a forward blade, the difference in said rake angles being at least 10° to locate the effective area of said rear blade in the accelerated flow from said forward blade.

4,514,147

CONTROLLED VALVING FOR A DUAL PUMP SYSTEM

August H. Borman, Farmington, and Erkki A. Koivunen, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 9, 1984, Ser. No. 598,242
Int. Cl.³ F04B 47/08
U.S. Cl. 417—288 3 Claims



1. Hydraulic control for a dual pump hydraulic system wherein the pumps provide hydraulic fluid for a high pressure operating system, a low presure operating system and a lubricating system, one of said pumps being a relatively small displacement pump; said control comprising first regulator valve means including a control chamber, spring means, pressure regulator chamber means, a pair of low pressure outlet port means connected to the low pressure operating system and a pair of inlet port means connected with said small displacement pump and the other pump respectively; first check valve means connecting the output of the other pump to both the output of the small displacement pump and one of said inlet port means; second check valve means disposed between said other pump and the other of said inlet port means; second regulator valve means including an inlet port continuously connected to the outlet of said other pump, a lube pressure outlet port, a regulating chamber connected with the low pressure system, a return

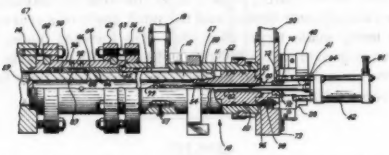
port connected to the inlet portions of both pumps, a control chamber, and spring means; and means for supplying control pressure to said control chambers on both said regulator valves for urging said regulator valves against the respective springs thereof, said first regulator valve responding to pressure in said high pressure system acting on said pressure regulator chamber means to sequentially connect said other pump through said second check valve means to said low pressure system and pass excess fluid from said small displacement pump to said low pressure system, and said second regulator valve responding to low pressure fluid operating in said regulating chamber to sequentially open said lube pressure outlet port to bypass fluid from said low pressure system to said lubricating system and open said return port to bypass the excess fluid in said low pressure system.

4,514,148

HYDRAULICALLY ACTUATED PUMP

George F. Topinka, Glen Ellyn, Ill., assignor to Carter Controls, Inc., Lansing, Ill.

Filed Nov. 1, 1982, Ser. No. 438,323
Int. Cl.³ F04B *21/08*
U.S. Cl. 417—403 **7 Claims**



1. An hydraulically-operated cylinder for actuating a reciprocating pump at high speed and pressure comprising a primary cylinder having a head end and a cap end,

a primary piston mounted for reciprocation within said cylinder, said piston having a piston rod, a spool casing connected at one end to the head end of said primary cylinder, said casing enclosing said piston rod, said rod being adapted to operate within a pump connected to the other end of said casing,

said casing and said primary cylinder each having an external circumferential flange for detachably securing said casing and cylinder together in axial alignment,

a bearing sleeve within said spool casing,

said sleeve having two sets of sealing rings therein, axially spaced from each other, a wiper exclusion ring disposed between the two sets of sealing rings and bearing against said primary piston rod, and

radial ports extending through said sleeve and said spool casing for discharging foreign material from the area of the rod and sealing rings.

4,514,149

CUTTING FLUID SUPPLY APPARATUS

Hiromu Kanebako, and Yasukiro Hisatomi, both of Chiba, Japan, assignors to Kuroda Precision Industries Ltd., Japan

Filed Oct. 13, 1983, Ser. No. 541,547
Claims priority, application Japan, May 7, 1983, 58-79959
Int. Cl.³ F04B *9/08;* F15B *21/02*
U.S. Cl. 417—403 **2 Claims**

1. In a fluid supply apparatus including a piston pump consisting of a piston cylinder for supplying fluid and an air cylinder for reciprocating said piston cylinder;

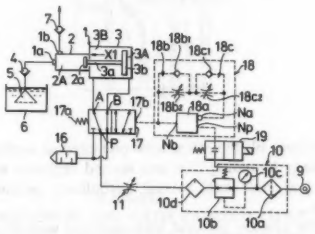
a direction change-over valve for making said air cylinder reciprocate, said change-over valve being changeable between two positions each providing for reciprocating movement by said air cylinder in a respective direction, such reciprocating movement causing corresponding pulsation in the flow of said fluid;

a compressed air source supplying compressed air to said cylinder through said direction change-over valve;

the improvement comprising:

a pulse frequency controlling means of self-oscillating character for controlling the position of said direction change-over valve within time limits, thereby determining the frequency of pulsations in the flow of said fluid; said pulse frequency controlling means being air operated, being thereby operable by air from said compressed air source, said direction change-over valve being also air-operated in response to air from said compressed air source controlled by said pulse frequency controlling means;

said pulse frequency controlling means comprising a fluidic NOT device having an air supply port for receiving compressed air from said source, an output port for supplying the compressed air to said direction change-over valve,



and an input port for causing the output port to provide compressed air from said source as as inverted function of air being supplied to said input port;

said pulse frequency controlling means including flow rate controlling valve means interconnecting said output port and said input port of said NOT device for controlling said time limits and comprising first and second flow rate regulating valves connected in series between said output port and said input port of said NOT device, said first and second check valves connected across the respective regulating valves to permit air to flow for a given direction between said input and output ports only through one of said regulating valves, said regulating valves each being adjustable respectively to provide a first time limit for a fluid intake stroke of said piston cylinder and a second time limit for a fluid dischage stroke of said piston cylinder.

4,514,150

SCROLL TYPE COMPRESSOR WITH DISPLACEMENT ADJUSTING MECHANISM

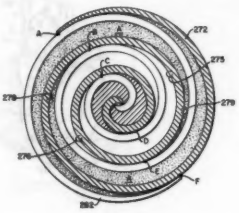
Masaharu Hiraga, Honjo; Atsushi Mabe, Isesaki, and Yuji Yoshii, Takasaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation-in-part of Ser. No. 356,648, Mar. 9, 1982, Pat. No. 4,468,178. This application Dec. 10, 1982, Ser. No. 448,490
Claims priority, application Japan, Mar. 9, 1981, 56-33646; Dec. 10, 1981, 56-198987
Int. Cl.³ F04B *49/02;* F04C *18/02, 29/08*
U.S. Cl. 417—440 **6 Claims**

1. In a scroll type compressor including a pair of scrolls each having an end plate and a wrap extending from one side surface of said end plate, said wraps interfitting at an angular and radial offset to make a plurality of line contacts between said wraps to define at least one pair of sealed off fluid pockets, and a driving mechanism operatively connected to one of said scrolls for orbiting said one scroll relative to the other one of said scrolls while preventing rotation of said one scroll to thereby change the volume of the fluid pockets, the improvement comprising:

one end plate having at least two pairs of holes in fluid communication with a suction chamber, said holes of each

pair of holes being located at symmetrical locations along the wrap which extends from said one end plate so that said other wrap simultaneously crosses over both of said holes in each pair of holes, the most inwardly placed hole of said pairs of holes being located within an area defined by ϕend-$2(n-1)\pi > \phi 1 > \phi$end-$2n\pi$, where ϕend is the final involute angle of said wrap which extends from said one end plate, $\phi 1$ is the involute angle at which said most inwardly placed hole is located and n is the number of pairs of holes, the most outwardly placed hole of said pairs



of holes being located within an area defined by $\phi(n-1)+2\pi > \phi n > \phi$end-$2\pi$, and the intermediate holes of said pairs of holes being located within an area defined by $\phi(k-1)+2\pi > \phi k > \phi(k+1)-2\pi$, where ϕk is the involute angle at which the kth hole from the most inwardly placed hole is located; and

control means for selectively opening and closed said pairs of holes to permit fluid communication therethrough to said suction chamber to thereby selectively control the displacement volume of said compressor.

4,514,151

LIQUID PULSATION DAMPENER DEVICE

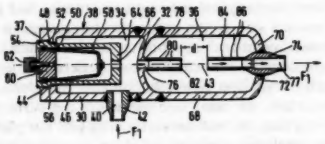
Christian Anders, Weidstasse 48, D-6710 Frankenthal, and Roland Beiersdörfer, Wählingstrasse 4, D-6520 Worms 24, both of Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,093

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044082

Int. Cl.³ F04B *11/00;* **F16L** *55/04*

U.S. Cl. 417—540 **4 Claims**



1. A liquid pulsation dampening arrangement for use in a piping network having a positive displacement pump with a delivery side for delivering fluid to the network in a flow direction comprising:

a hydro-pneumatic dampener having a first chamber with a bladder member therein for separating a pneumatic fluid space from a liquid fluid space in said first chamber;

a first connection from said network downstream of said pump delivery side to said liquid fluid space;

a dynamic dampener having a second chamber with an inlet, an outlet and the means extending from said inlet and outlet for reducing vibrations in the liquid fluid;

a second connection in the network between said first connection and said second chamber inlet for connecting said dynamic dampener downstream of said hydropneumatic dampener in said network;

said means for reducing vibrations comprising a first pipe section extending from said inlet into said second chamber and a second pipe section extending from said outlet into said second chamber, said first and second pipe sections separated by a selected spacing in said second chamber;

a housing defining said second chamber and a third chamber, said first chamber defined in said third chamber, said first connection comprising an opening into said third chamber and an opening between said first chamber and said third chamber, said dynamic dampener inlet extending between said third chamber and said second chamber;

said housing including a longitudinal axis, said dynamic inlet and outlet and said opening between said first and third chambers axially aligned along said longitudinal axis, said first connection opening into said third chamber extending at an angle to said longitudinal axis; and

a partition which is convex toward said third chamber extending across said housing before dividing said housing into said third and second chambers, said dynamic dampener inlet extending centrally through said partition.

4,514,152

GEROTOR POWER STEERING APPARATUS WITH DRIVEN ROTARY SLEEVE VALVE

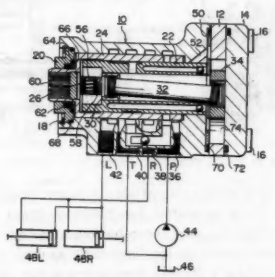
Takashi Takamatsu, Chigasaki, and Tetsuo Ohnuki, Fujisawa, both of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,442

Claims priority, application Japan, Aug. 2, 1982, 57-135012; Aug. 4, 1982, 57-136103

Int. Cl.³ B62D *5/08;* **F15B** *13/04*

U.S. Cl. 418—61 B **4 Claims**



1. A gerotor steering apparatus comprising:

a housing;

a gerotor mechanism provided with a stator fixed to said housing and having teeth, a rotor having teeth of a number less by one than the number of said teeth of said stator, and a plurality of liquid chambers formed between said stator and said rotor so as to be expandable and contractible in accordance with rotation of said rotor; and

rotary valve mechanism means having fluid paths to be switched over by a steering operation for rotating said rotor of said gerotor mechanism in a direction corresponding to the steering operation and for supplying pressurized liquid in an amount proportional to the degree of the steering operation from said liquid chambers contracted by the rotation of said rotor to actuators of a steering mechanism, said rotary valve mechanism comprising:

a sleeve rotatably positioned within said housing and including means for direct connection at all times to a rotary shaft to be rotated within said housing by a steering operation;

a spool positioned within said sleeve for rotation relative thereto;

switchover fluid paths for supplying pressurized fluid from a source to said gerotor mechanism to rotate said rotor in response to rotation of said sleeve, said fluid

paths comprising perforations formed in said sleeve and in said spool and through holes formed in said housing at positions closely adjacent said gerotor mechanism, said through holes opening into said liquid chambers; and

means connecting said rotor to said spool for transmitting rotation of said rotor to said spool in a follow-up manner.

4,514,153

ROTARY VANE PUMP WITH CLUTCH

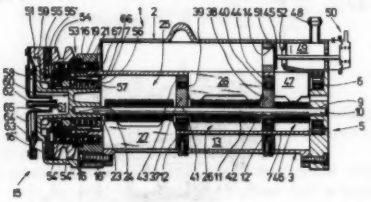
Rainer Südbeck, Duisburg, and Hans Baumgartner, Viersen, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG., Neuss, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,882

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128432

Int. Cl.³ F04C *2/00, 11/00, 27/00;* **F16D** *25/02*

U.S. Cl. 418—69 **13 Claims**



1. In a vane pump comprising a pump housing, a hollow cylindrical rotor mounted for rotation about its own axis within said housing, said rotor having a cylindrical wall containing a plurality of circumferentially spaced and axially extending openings, a driving means at one end of said housing for rotating said rotor, a vane shaft mounted to extend eccentrically within said rotor, a plurality of rotatable vanes mounted on said vane shaft whereby said vanes extend axially on said shaft and project radially through said openings in said cylindrical wall of said rotor, said vanes thereby being rotated about the axis of said vane shaft when said rotor is rotated, means defining a pump chamber within said housing which is swept by said vanes as said vanes are rotated by said rotor, and inlet and outlet means for the fluid to be pumped communicating with said pump chamber, the improvement wherein said vane shaft has opposite ends with each said opposite end nonrotatably and directly mounted in said pump housing whereby only said vanes are driven by said rotor, said driving means includes a driving wheel mounted coaxially with respect to said rotor and a clutch for coupling and uncoupling said driving wheel with said rotor, said clutch comprises a follower member mounted coaxially with said driving wheel whereby said follower member is axially displaceable into and out of engagement with said driving wheel and is rotatably fixed to said rotor, a thrust bearing carried by said follower member and having a cap, a spring biassing said follower member out of engagement with said driving wheel, a movable cover operatively connected to said thrust bearing cap, a fixed part defining with the movable cover an enclosed chamber, and a connection for the supply of pneumatic pressure to said chamber for operating said clutch.

4,514,154

SELF-SEALING ABUTMENT

Concezio Mazzagatti, Sante Fe 3786, 4° A, Buenos Aires, Argentina

Continuation of Ser. No. 341,126, Jan. 20, 1982, abandoned. This application Apr. 20, 1984, Ser. No. 601,749

Claims priority, application Argentina, Jul. 16, 1981, 286122

Int. Cl.³ F01C *19/02;* **F04C** *27/00*

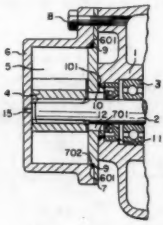
U.S. Cl. 418—129 **14 Claims**

1. In a fluid-operated machine which includes a stator casing, said stator casing having a substantially cylindrical inner face that defines a substantially cylindrical space therein, said substantially cylindrical space having an imaginary axial line therethrough; an elongated housing extending outwardly from said stator casing, said elongated housing extending parallel to said imaginary axial line, said housing having opposite sides and an interior chamber which communicates with the substantially cylindrical space in said stator casing; an eccentric piston rotor positioned in the substantially cylindrical space in said stator casing, a portion of the periphery of said piston rotor being in sealing contact with the inner face of said stator casing; a piston shaft connected to said piston rotor, said piston shaft extending along said imaginary axial line, rotation of said piston shaft causing said portion of the periphery of said piston rotor to move along the inner face of said stator casing and divide said substantially cylindrical space into two variable volume chambers; a self-sealing abutment member movably positioned in the inner chamber in said elongated housing to move in and out of the substantially cylindrical space in said rotor housing based on the rotational positioning of the piston rotor therein; and a spring means located with the interior chamber in said elongated housing so as to bias said abutment member toward said piston rotor, the improvement wherein said abutment member consists of at least one plate assembly, each plate assembly consisting of two generally coplanar flat plates, each of said two generally coplanar flat plates defining a bottom surface, an outer side surface, a top surface and an inner side surface, the bottom surfaces of said flat plates being parallel and in sliding contact with the periphery of said piston rotor, the outer side surfaces of said flat plates being parallel and in sliding cooperation with the opposite sides of said elongated housing, the inner side surfaces of said two flat plates having respective lower ends which merge with the associated lower surfaces of the flat plates and upper ends which are always located within the interior chamber within said elongated housing, the lower portion of the inner side surface of the first of said two flat plates being straight and extending upwardly from its associated bottom surface at an obtuse angle, the lower portion of the inner side surface of the second of said two flat plates being straight and extending upwardly from its associated bottom surface at an acute angle, the inner side surfaces of said two flat plates being in sliding cooperation with one another such that as said first flat plate moves downwardly with respect to said second flat plate to maintain the bottom surfaces of said two plates in alignment with one another and in sealing relationship with the periphery of said piston rotor, their outer side surfaces will maintain sealing cooperation with the opposite sides of said elongated housing.

4,514,155
ROTARY VANE PUMP WITH PACKING MEANS FOR THE HOUSING COMPONENTS

Hitoshi Ogawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,927, May 5, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 623,542
Claims priority, application Japan, May 11, 1981, 56-68099[U]; May 11, 1981, 56-68100[U]
Int. Cl.³ F04C 27/00
U.S. Cl. 418—149 2 Claims

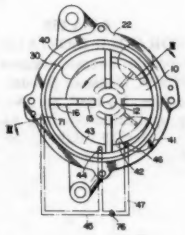


1. A pump device which comprises:
a housing comprising a cylindrical operation chamber, said operation chamber comprising
a cylindrical inner wall,
a substantially closed front end, and
a rear opening having a diameter equal to that of said cylindrical inner wall, said rear opening being chamfered, said housing further comprising a flat rear face normal to the axis of said operation chamber and containing said rear opening of said operation chamber,
said pump device further comprising an intake port and an exhaust port, both in communication with said operation chamber,
a rotatable driving shaft, one end of which is disposed in said operation chamber, the axis of said driving shaft being parallel to and offset from said axis of said operation chamber,
a rotor fixed to said driving shaft in said operation chamber,
a plurality of radially-extending vanes disposed in said rotor, said vanes being in sliding contact with said cylindrical inner wall of said housing to forcibly feed a fluid from said intake port to said exhaust port,
a plate fixed and fitted to said rear face of said housing and having a front face, a rear face and a cylindrical bore for the passage of said driving shaft, said front face of said plate further comprising a front flat land for snugly contacting said flat rear face of said housing, and a cylindrical front shoulder raised from said front flat land, said front shoulder of said plate extending into said operation chamber through said chamfered opening and mating with said cylindrical inner wall of said operation chamber,
a first packing disposed around said front shoulder of said plate and being compressed between said front face of said plate and said chamfer of said rear opening of said operation chamber,
said rear face of said plate comprising a rear flat land and a cylindrical rear shoulder raised from said rear flat land, said rear shoulder being concentric about said cylindrical bore for the passage of said driving shaft,
an end frame comprising means for rotatably supporting said driving shaft, a flat front face, and a chamfered cylindrical passage, in which said driving shaft is disposed, opening into said flat front face of said end frame, said rear face of said plate being fixed and fitted to said front face of said end frame, said rear shoulder of said plate extending into said cylindrical passage in said end frame and mating with the cylindrical wall thereof, said rear flat land of said plate snugly contacting said flat front face of said end frame, and
a second packing disposed around said rear shoulder of said plate and being compressed between said rear face of said plate and said chamfer of said cylindrical passage of said end frame, wherein said front shoulder of said plate and said rear shoulder of said plate respectively comprise means for establishing and maintaining proper positioning of said first and second packings during assembly of said pump device.

4,514,156
ROTARY-SLEEVE BEARING APPARATUS FOR ROTARY COMPRESSOR

Hiroshi Sakamaki, Utsunomiya; Yukio Horikoshi, Kazo, and Kikuji Yanagihashi, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,994
Claims priority, application Japan, May 20, 1983, 58-87737
Int. Cl.³ F04C 18/348
U.S. Cl. 418—173 2 Claims

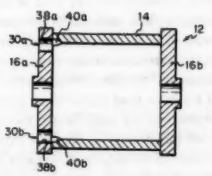


1. A rotary-sleeve bearing apparatus for rotary compressor provided with a center housing, a rotary sleeve rotatably mounted in said center housing, a rotor disposed within said rotary sleeve, a plurality of vanes movably fitted in said rotor, and a discharge chamber, said apparatus comprising a thin air-bearing room defined between the inner periphery of said center housing and the outer periphery of said rotary sleeve, an inlet provided on the compression-side inner surface of said center housing, and an air-supply passage extending from a compression working space immediately before internally connected to said discharge chamber, said air-supply passage being connected to said discharge chamber through an auxiliary passage provided with a check valve.

4,514,157
ROTARY VANE COMPRESSOR

Teruo Nakamura, and Shoichi Fukuda, both of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 613,996
Claims priority, application Japan, Jun. 3, 1983, 58-84985[U]
Int. Cl.³ F04C 18/00
U.S. Cl. 418—259 1 Claim



1. A rotary vane compressor comprising:
a cylinder having a bore and a delivery port formed therein;

a pair of side blocks for closing respectively opposite open ends of said cylinder;

a rotor rotatably disposed in said bore of the cylinder and formed with a plurality of substantially radially extending slots;

a plurality of vanes slidably received in said slots in one-to-one correspondence and individually engaged with an inner periphery of said bore of the cylinder;

a compression chamber defined by the cylinder, the rotor and any of the vanes; and

an opening formed through one of the side blocks and extended such that radially outer part of a rim of said opening is positioned radially outwardly of the inner periphery of the cylinder, and a notch formed in the inner periphery of the cylinder to be aligned with said outer part of the rim of said opening, said opening and said notch defining the suction port in combination.

4,514,158

PLANT FOR COLD ISOSTATIC PRESSING

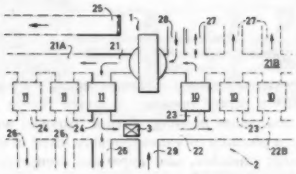
Ola Pettersson, Höganäs, Sweden, assignor to KB Cold Isostatic Press Systems CIPS, Hoganas, Sweden

Filed Mar. 20, 1984, Ser. No. 591,593

Claims priority, application Sweden, Apr. 19, 1983, 8302200

Int. Cl.³ B29C *3/00*

U.S. Cl. 425—78 **6 Claims**



1. A device for cold isostatic pressing of powder to pressed bodies, including an isostatic press, a plurality of press tools, a circulation conveyor path for the tools, and means for advancing the tools along the path, the tools being arranged along the path to pass a tool filling station, the path including; a first and second straight conveyor section positioned parallel and separate to each other, the first conveyor section extending through the press, a plurality of third, straight, mutually parallel sections, each of said third parallel sections extending through an associated filling station and connecting at a right angle between the second conveyor section and the first conveyor section at a portion of the conveyor path situated to one side of the press, a plurality of fourth conveyor sections, each of said fourth conveyor sections extending through an associated emptying station and connecting at a right angle between the second conveyor section and the first conveyor section at a second portion of the conveyor path situated on an opposite side of the press, a first service conveyor connected to the second conveyor section for permitting discharge of inoperative tools from the circulation conveyor path, a second service conveyor connected to the circulation conveyor path for supplying said tools to said circulation conveyor path so as to replace tools removed by said first service conveyor, a third service conveyor connected to the first conveyor section so as to permit the removal of inoperative tools from the circulation conveyor path subsequent to passing said filling station and prior to delivery to the press, and wherein the tools are provided with a substantially rectangular base, a side of said base being substantially as long as the conveyor path width.

4,514,159

APPARATUS FOR PRODUCING MOLDED PLASTIC ARTICLES SUCH AS PACKAGING TUBES

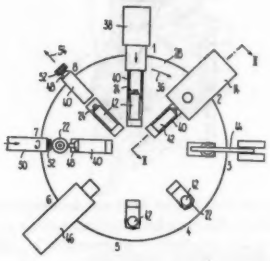
Karl Mägerle, Kusnacht, Switzerland, assignor to KMK Karl Mägerle Lizenz AG, Zug, Switzerland

Division of Ser. No. 364,792, Apr. 2, 1982, Pat. No. 4,419,064, which is a division of Ser. No. 165,396, Jul. 2, 1980, Pat. No. 4,352,775. This application Jul. 7, 1983, Ser. No. 511,623

Claims priority, application Switzerland, Jul. 12, 1979, 6502/79

Int. Cl.³ B29D *23/04*

U.S. Cl. 425—125 **12 Claims**



1. Apparatus for producing a molded article from plastic material, in which a blank of plasticizable, heated plastic material is introduced into a shaping cavity and pressed thereagainst with a stamp to produce a molded article,

said apparatus comprising:

a rotary table means;

a plurality of upwardly opening shaping cavity means provided on said rotary table means at equi-angularly distributed locations in a coaxial ring, each shaping cavity means having shaping surface means therein;

a respective plurality of stamps, each paired with a respective shaping cavity means, and mounted by mounting means to rotate with said rotary table means;

each stamp being movably mounted by the respective mounting means for movement between a first position wherein that stamp is spatially displaced from vertically obstructing relation to the respective shaping cavity means and extending substantially horizontally and a second position, wherein such stamp is vertically juxtaposed upon the respective shaping cavity means in vertically obstructing relation thereto and positioned to be thrust into partially filling, closing relation with the respective shaping cavity means;

means coordinated with rotation of said rotary table means for periodically moving each stamp between said first and second positions thereof, and for thrusting that stamp once into said partially filling, closing relation then withdrawing during each time interval that stamp is in said second position thereof;

a supply means for plasticizable, heated plastic material, said supply means having an extruding-type material supply head in vertical juxtaposition over the rotary table means at a site so spatially determined, that as said rotary table means rotates, the shaping cavity means are successively temporarily brought into directly underlying relation with said material supply head for dispensing into each such shaping cavity means a respective blank of plasticizable, heated plastic material, said supply head having a substantially vertically downward extruding direction;

said stamp moving means also being coordinated with regard to approaching juxtaposition of each succeeding stamp and shaping cavity means pair, so that as each said pair approaches said site, the respective stamp is moved from said second position thereof to said first position thereof to be out of the way in time to permit the material

supply head to dispense a blank of plasticizable, heated plastic material into the respective shaping cavity.

4,514,160

INJECTION NOZZLE WITH DIRECT ELECTRIC HEATING

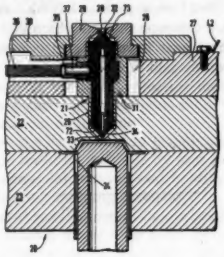
Walter F. Davidsmeyer, Glatzer Weg 15, 3004 Isernhagen 2, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,906

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301272

Int. Cl.³ B29F *1/03, 1/08*

U.S. Cl. 425—143 **21 Claims**



1. A device for feeding flowable materials from an injection molding unit to a mold with at least one hot channel nozzle which possesses a nozzle channel, for the flow of the material up to a nozzle bore, an electrical heat conductor, wherein the nozzle channel is constructed as a tube of electrically conductive material and acts as an electrical resistance heater up to the nozzle bore the tube construction being such that resistance per unit length differs for different portions of said tube so that an essentially uniform temperature of the flowable material is insured up to the nozzle outlet bore.

4,514,161

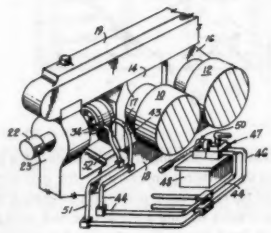
HYDRAULIC ROLL PROTECTION SYSTEM

William J. Winter, Trumbull, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 9, 1983, Ser. No. 559,952

Int. Cl.³ B29C *15/00;* **B30B** *3/04*

U.S. Cl. 425—154 **6 Claims**



1. A hydraulic roll protection system for cooperating rolls forming a nip gap including journal boxes carrying the rolls for rotation, at least one roll being movable with respect to a fixed roll for varying the nip gap therebetween, said movable roll being carried by journal boxes slidable in guideways, an adjustable screw associated with each slidable box for adjusting the movable roll toward and away from the fixed roll, a fluid operated piston and cylinder device interposed between one end of each screw and the associated journal box, means including a hand operated pump for pressurizing one end of each cylinder and piston device for movement into extended condition, a pressure relief valve between the pump and the device for controlling the pressure in the cylinder acting to hold the movable roll in adjusted closed condition and to relieve excessive pressure in the cylinder on overload conditions between the rolls, and a valve for switching the fluid pressure from the pump from the one end of the cylinder to the other end of the cylinder to move the piston and cylinder device into retracted condition for retracting the movable roll from the fixed roll.

4,514,162

APPLIANCE FOR HEATING AN ELECTROCONDUCTIVE MATERIAL IN THE FORM OF A CONTINUOUS STRAND

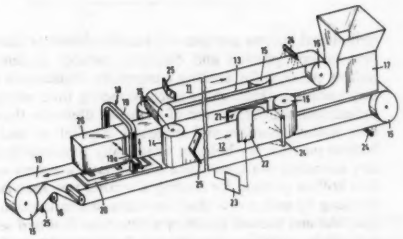
Eckhard Schulz, Wallenhorst, Fed. Rep. of Germany, assignor to Sicowa Verfahrenstechnik fur Baustoffee GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 459,951

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203131

Int. Cl.³ B29C *15/00*

U.S. Cl. 425—174.8 R **16 Claims**



1. An Appliance for heating an electroconductive material, preferably one which hardens as a result of this heating process, this material being in the form of a continuous strand comprising: a high-frequency generator **(23)**, a channel **(14)** formed by walls **(10** to **13)** composed of an electrically insulating material and within which the continuous strand is guided, two capacitor-plates **(30)** arranged on two oppositely located sides of the channel **(14)**, the capacitor plates **(30)** being staggered by at least their length and being connected to a non-earthed terminal of the high-frequency generator **(23)**, while two further capacitor plates **(31,32)** are arranged on each of the two sides, adjacent to the two capacitor plates **(30)**, the further capacitor plates **(31, 32)** being connected to the earthed terminal of the high-frequency generator **(23)** and extending along the channel **(14)** for a distance such that the strand outside the heating zone is no longer on poential with respect to earth potential.

4,514,163

SYNTHETIC RESIN EXTRUDING MEANS

Kensaku Nakamura, 272-1, Bessho-cho, Matsubara, Osaka, Japan

Filed Nov. 28, 1983, Ser. No. 555,651

Int. Cl.³ B29F *3/00, 3/02*

U.S. Cl. 425—204 **2 Claims**

1. In a synthetic resin extruding apparatus, the improvement comprising:

an elongated cylindrical screw shaft comprising a screw shaped grooved surface on the outer periphery thereof;

a cylindrical heater coaxially surrounding said screw shaft;

a feed mouth disposed at one end of said screw shaft for feeding a first raw material for kneading by said screw shaft; and

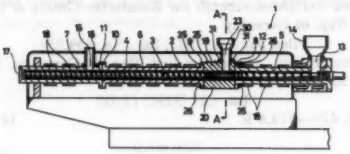
an exit mouth disposed at another end of said screw shaft for exiting of said material after kneading by said screw shaft;

said screw shaft comprising at least two segments, a first segment having said grooves, and a second segment having said grooves with teeth on walls forming said grooves;

a lower block disposed about substantially a lower part of said second segment;

an upper block movably connected to said lower block so that in a closed position said upper and lower blocks surround said second segment of said screw shaft, and having an open position in which said upper and lower blocks are partially disconnected from each other to permit access thereto and thereby to enable manual replacement of auxiliary kneading shafts;

said upper and lower blocks each comprising a corresponding first elongated cylindrical hollow portion for fitting about said screw shaft, a corresponding second elongated



cylindrical hollow portion of a smaller diameter than said first hollow portion and disposed parallel to said first hollow portion, for holding a manually replaceable auxiliary kneading shaft, and a corresponding third elongated cylindrical hollow portion of a smaller diameter than said first hollow portion and disposed parallel to said first hollow portion, for holding a manually replaceable auxiliary kneading shaft, and feed means having access to said first hollow portion for feeding a second raw material for working by said screw shaft operable in conjunction with said first and second auxiliary shafts; said first and second replaceable auxiliary kneading shafts having screw shaped groove surfaces on the periphery thereof with teeth on the walls defining the grooves, said teeth being engagable with said teeth on said screw shaft.

4,514,164

REDUCTION GEAR SYSTEM FOR TWIN SCREW EXTRUDING SYSTEM

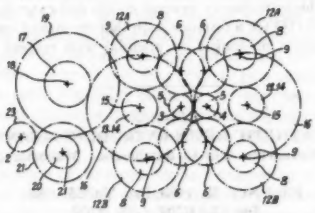
Jean L. Poulin, Saint-Die, France, assignor to Societe dite: USINES BEYER FRERES, France

Filed Feb. 23, 1984, Ser. No. 582,766

Claims priority, application France, Mar. 2, 1983, 83 03443

Int. Cl.³ B29F *3/02*

U.S. Cl. 425—208 **8 Claims**



1. In a twin screw extruding machine, a reduction gear system comprising a casing, an input shaft, two output shafts supported by said casing, each in alignment with a respective one of said screws, a respective first pinion on each of said output shafts, said first pinions being offset relative to one another in the axial direction and said first pinion on a first of said output shafts being a helical pinion so as to develop a component of force in the axial direction opposite a reaction to the thrust exerted by the associated screw of the extruding machine, two first helical gears meshing with said first pinion on said first output shaft at diametrically opposite points thereon, a respective second helical pinion meshing with each of said first helical gears, a respective thrust shaft to which each of second helical pinions is keyed, a respective thrust bearing at one end at least of each of said thrust shafts, a respective second helical gear keyed to each of said thrust shafts, said second helical gear keyed to one of said thrust shafts having its teeth inclined in the direction opposite that of the teeth of said second helical pinion on said one thrust shaft and said second helical gear keyed to the other of said thrust shafts having its teeth inclined in the same direction as the teeth of said second helical pinion on said other thrust shaft, a respective third helical pinion meshing with each of said second helical gears, said third helical pinions having teeth inclined in opposite directions, a common shaft to which said third pinions are fixed, and a third gear keyed to said common shaft and adapted to be driven by said input shaft.

4,514,165

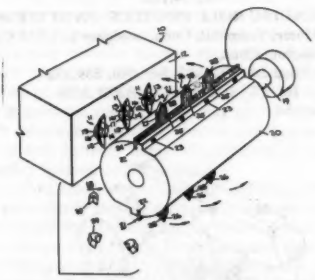
APPARATUS FOR MAKING BILLOWED FILLING ELEMENTS FOR PACKAGING

Harry Bussey, Jr., P.O. Box 115 Serpentine Rd., Navesink, N.J. 07752

Division of Ser. No. 400,719, Jul. 22, 1982, Pat. No. 4,440,704, which is a division of Ser. No. 230,113, Jan. 29, 1981, abandoned. This application Nov. 9, 1983, Ser. No. 550,125

Int. Cl.³ B29C *17/10*; B29F *3/00*

U.S. Cl. 425—311 **9 Claims**



1. In an apparatus for making filling elements for packaging, the combination comprising an extruder for extruding a heat-plastified mass of thermoplastic material containing an expanding agent, said extruder having a die at one end, said die having a surface with at least one orifice therein for extrusion of the heat-plastified mass there-through along a longitudinal axis, and a rotary cutter having at least one cutting blade having a non-linear cutting edge for cutting the mass extruded through said orifice, said edge being shaped so as to mate with said die surface, said cutter being disposed in proximity to said extruder on an axis of rotation perpendicular to said longitudinal axis and in spaced facing relation to said die to move said non-linear edge of said blade through an arcuate path to mate with said die and orifice in an extrudate cutting relationship to cut individual pieces from the extruded mass.

4,514,166

DEVICE FOR REMOVING AND CONVEYING INJECTION-MOLDED PIECE

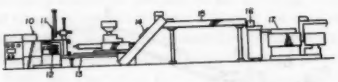
Yoshiyuki Ichizawa, Sohka; Tsugio Nomoto, Kurume, and Mamoru Oshida, Funabashi, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1979, Ser. No. 32,970

Claims priority, application Japan, Apr. 24, 1978, 53-48573; Apr. 24, 1978, 53-48575; Apr. 24, 1978, 53-54350[U]

Int. Cl.³ B29F *1/14*

U.S. Cl. 425—436 R **9 Claims**



1. A device for removing injection molded cylindrical preforms, having gates at closed ends thereof, from an injection molding machine, comprising:

holding means for releasably gripping said preforms in said injection molding machine by said gates; and

moving means for moving said holding means to and from said injection molding machine,

wherein said holding means comprises first and second relatively slidable plates with holes perforated therethrough and sliding means for relatively slidably moving said first and second plates, whereby said gates are gripped after insertion through corresponding holes on said first and second plates by relative sliding movement of said first and second plates.

4,514,167

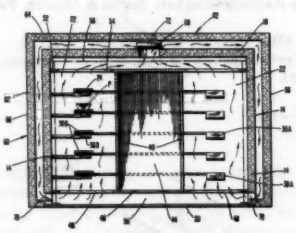
OVEN HEATING SYSTEM

Wayne H. Royer, Felton, Pa., assignor to Santrade Ltd., Lucerne, Switzerland

Filed Oct. 11, 1983, Ser. No. 540,924

Int. Cl.³ F27D *3/00, 7/00;* F27B *9/22, 9/00*

U.S. Cl. 432—11 **28 Claims**



1. A baking oven comprising:

an enclosure containing therein a horizontally annular baking chamber,

conveyor means arranged to travel in an endless helical path through said baking chamber while carrying a product to be baked,

heating means located beneath at least some of the runs of said conveyor means for heating the air within said baking chamber, air distributing means comprising:

conduit means for conducting air from an upper portion of said baking chamber to a lower portion of said baking chamber, and

air circulating means for transferring air through said conduit means from said upper portion of said baking chamber to said lower portion of said baking chamber, to attain a more uniform air temperature within said baking chamber, and

a floor beneath a substantial portion of said baking chamber, said conduit means delivering air to a lower air space beneath said floor, said floor being air permeable such that the air travels through said floor and into said baking chamber, the degree of air permeablility of said floor increasing in a direction away from an air inlet where said conduit means delivers air to said lower air space.

4,514,168

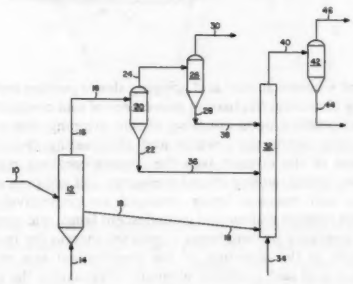
PROCESS FOR HEATING SOLIDS IN A TRANSFER LINE

Henry G. McMath, and Gary K. Stenerson, both of Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 15, 1983, Ser. No. 523,480

Int. Cl.³ F27B *15/00;* F26B *3/08*

U.S. Cl. 432—14 **13 Claims**



1. A process for preheating solids containing particles of varying sizes without deleteriously affecting yields in a subsequent conversion process to which the preheated solids are fed by contacting said solids with a hot gas in a transfer line which comprises:

(a) separating said solids into a plurality of size fractions;

(b) introducing said hot gas into said transfer line at a point near one end;

(c) introducing a size fraction of solids produced in step (a) as a first fraction of solids into said transfer line at or downstream of the point where said hot gas is introduced;

(d) separately introducing one or more other size fractions of solids produced in step (a) that contain smaller particles than said first fraction into said transfer line at a predetermined distance or distances downstream of where said first size fraction is introduced, wherein the predetermined distance or distances are inversely related to the size of the particles comprising the other size fraction or fractions so that the size fraction of solids containing the smallest particles is introduced into said transfer line at a point furthest away from the point where said first size fraction is introduced; and

(e) withdrawing preheated solids from said transfer line which are ready for passage to downstream processing units.

4,514,169

DENTAL HANDPIECE

Ernst Strohmaier, Schussenried, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Riss, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,692

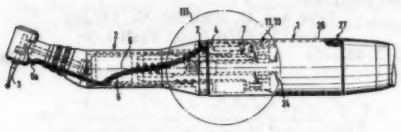
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332628

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—29 **31 Claims**

1. In a dental handpiece, including a connector portion and an elongated, exchangeable gripping sleeve portion coupled to

said connector portion, including a treating implement arranged on said gripping sleeve portion end distant from said connector portion, an incandescent lamp in said connector portion, and a light conductor in said gripping sleeve portion having the end of said light conductor distant from said connector portion directed towards the area of the implement, and the end of said light conductor distant from said implement being suppliable with light from said incandescent lamp; the improvement comprising in that switch contacts are operatively associated with said incandescent lamp, said switch contacts being movable relative to each other so as to be in a contact position facilitating power supply to said incandescent



lamp, and wherein at least said gripping sleeve portion includes adjusting elements effectuating movement of said contacts into a contact position upon coupling of said gripping sleeve portion to said connector portion and effectuating the return movement of the contact into the contact-breaking position responsive to uncoupling of said connector and gripping sleeve portions, said contacts being arranged on respectively the connector portion and on said incandescent lamp, said contacts in said connector portion being supported therein for reciprocal motion in the direction of the longitudinal axis of said handpiece, and said adjusting elements effectuating the reciprocating motions of the incandescent lamp.

4,514,170

APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

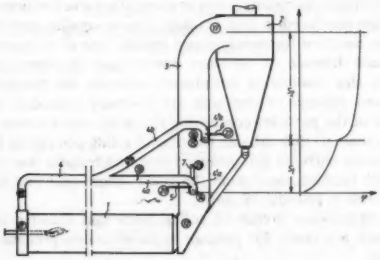
Detlev Kupper, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,603

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237689

Int. Cl.³ F27B *7/02*

U.S. Cl. 432—106 **11 Claims**



1. In apparatus for the heat treatment of fine-grained material having a multistage preheater communicating with a kiln via an upwardly extending exhaust gas duct forming a precalcination zone into which fuel is introduced between said kiln and said preheater, and a cooler into which heat treated material is delivered from said kiln, the improvement comprising a pair of cooling air ducts extending between said cooler and said exhaust gas duct and communicating with the latter at vertically spaced zones; means for introducing said fuel into each of said ducts to form a mixture of fuel and air for delivery into said exhaust gas duct adjacent each of said zones; and material duct means communicating between said preheater and the lower one of said cooling air ducts for delivering preheated material to the latter from said preheater.

4,514,171

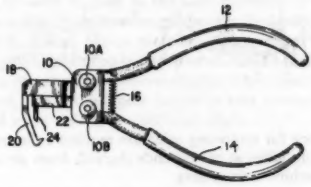
ORTHODONTIC TOOL

Craven H. Kurz, 465 N. Roxbury Dr., #1011, Beverly Hills, Calif. 90210

Filed Jul. 30, 1984, Ser. No. 635,562

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—4 **5 Claims**



1. A tool for removing an adhesively bonded orthodontic bracket or tube from the lingual surface of a tooth which comprises: first and second members pivotally coupled to one another, said first and second members defining first and second handles and first and second heads for the tool; a depending post mounted on one of the heads in position to engage the top of a bonded bracket or tube to be forced between the bracket or tube and the tooth to which it is bonded; and an elongated depending catch member mounted on the other of the heads and having a tip at the distal end thereof in position to extend under the edge of the bracket or tube when the post engages the top of the bracket or tube as the handles are squeezed together.

4,514,172

APPARATUS SUPPORTING A PLURALITY OF DENTAL INSTRUMENTS

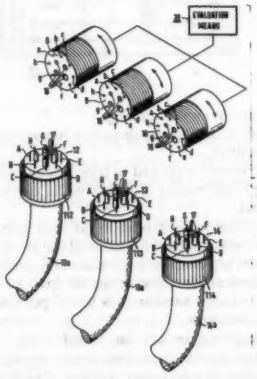
Wolfgang Behringer, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,779

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243294

Int. Cl.³ A61C *1/08*

U.S. Cl. 433—126 **6 Claims**



1. In an apparatus for supporting a dental handpiece and for supplying necessary operating agents to the handpiece, said

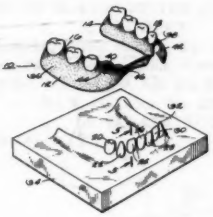
handpiece having a hose containing supply lines extending to a connecting member, said apparatus including a housing having support means including at least one support recess for receiving and storing a dental handpiece, a coupling member for each support means coacting with the connecting member of the handpiece to connect agent supply lines in the housing to the supply lines of the hose of the handpiece, and control means for controlling the flow of agents to the elements in the coupling member, the improvements comprising said housing including a source of water, a source of air and at least one source of electrical power, each coupling member being disposed in an easily accessible portion of the housing, said connecting and coupling members being designed for easy releasable interconnection, said coupling member being constructed with elements for separately transferring electrical power, air and water from the sources in the housing to the connecting member of the handpiece, said control means having evaluation means for receiving signals indicating the type of handpiece being connected to the coupling member and selectively connecting the various sources to the elements of the coupling member in response to the indicated type of handpiece, and said coupling member and connecting member having cooperating coding means for creating a signal to indicate the type of handpiece being connected by the coupling member so that the evaluation means automatically selects the desired agents for a specific type of handpiece when that handpiece is connected to the coupling member.

4,514,173

DENTURE COUPLING

Eugene L. Re, 1920 SW. 52nd Ter., Plantation, Fla. 33317

Filed Jan. 30, 1981, Ser. No. 229,827
Int. Cl.³ A61C *13/02*
U.S. Cl. 433—178 **1 Claim**



1. In a prosthetic denture of the type adapted for repetitive detachable engagement with at least the terminal teeth of a series of consecutive remaining natural teeth, said denture comprising buccal and lingual flanges depending from an artificial tooth anchoring portion thereof, said buccal flange having first and second separated portions extending generally posteriorly of said terminal teeth, wherein a portion of said denture positioned adjacent at least one of said remaining natural teeth has no buccal flange; the improvements comprising:

A. clasping members defined by horseshoe-shaped walls integrally formed in the anterior ends of said first and second separated portions to embrace the neck portions of at least said terminal teeth; and

B. a sealing member for each wall comprising elastomeric material bonded to and substantially coextensive with said wall for forming a continuous line seal between said wall and the embraced portion of the terminal teeth;

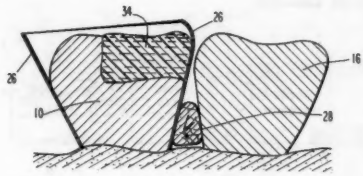
whereby to anchor said denture to said terminal teeth while preventing the entry of foreign matter between said walls and the embraced portions of said teeth.

4,514,174

METHODS FOR POSTERIOR DENTAL RESTORATION EMPLOYING LIGHT CURABLE PACKABLE COMPOSITIONS

Emery W. Dougherty, York, Pa.; John B. Heyde, Milford, Del.; Richard J. Bennett, Milford, Del.; Roy L. Smith, Milford, Del.; Louis H. Tateosian, and George T. Eden, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Nov. 19, 1982, Ser. No. 443,154
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—226 **24 Claims**



14. A method for the restoration of a tooth comprising:

selecting a tooth in need of restoration;

removing a portion of said tooth to form a cavity preparation;

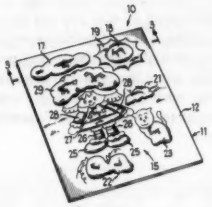
applying to said cavity preparation a light curable restorative composition having a resistance to penetration of at least about 175 g./mm^2; compacting said composition and polymerizing said composition by exposure thereof to actinic light for a time sufficient substantially to harden said composition.

4,514,175

CHILDREN'S STUFFED-ART CRAFT SET

John V. Zaruba, Chicago; Steven P. Hanson, Winnetka; Beth E. Luecke, Chicago, and Wayne A. Kuna, Oak Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 20, 1984, Ser. No. 572,302
Int. Cl.³ G09B *11/00*
U.S. Cl. 434—82 **15 Claims**



1. A children's craft set comprising:

a backing board having a face surface and an opposite surface;

two-dimensional graphics defining a plurality of elements on the face surface;

a first opening conforming in shape to at least one of the elements extending through the background board;

a first backing piece conforming in shape to the first opening and fitting into the first opening leaving a first peripheral gap; and

a first piece of resilient material large enough to cover the opening with some extra material remaining to wedge into the first peripheral gap between the first backing piece and the first opening when the first piece of material and the

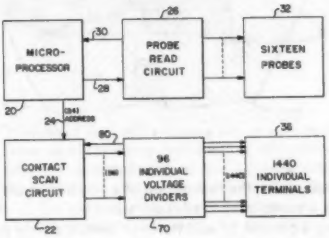
first backing piece are pushed into the first opening from the opposite side to secure the first backing piece in the first opening.

4,514,176

AUTOMATIC TEACHING APPARATUS AND METHOD

Don S. Boyer, Placentia, and John C. Freeborn, West Covina, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 13, 1983, Ser. No. 484,652
Int. Cl.[3] G09B *5/00*
U.S. Cl. 434—224 **4 Claims**



1. In a teaching machine, in combination:
a plurality of resistors interconnected at junction points in a plurality of individual series circuits:
a plurality of simulator terminals, at predetermined locations, connected in known relation to said junction points:
a plurality of simulator probes engagable individually with any one of said terminals:
voltage responsive output means;
means selectively connecting said output means to said probes individually in a first sequence;
means initially maintaining all said junction points at a predetermined voltage, so that when a selected probe is brought into engagement with any terminal, said output means gives an output, whereby to indicate which of said probes is engaging some contact by the site in said first sequence at which said output is given;
and means for successively establishing voltage differences across selected ones of said circuits in a second sequence, so that the voltages at said junction points in each selected circuit differ mutually and from said predetermined voltage, whereby, when the terminal engaged by said probe is in connection with a junction in the selected circuit, said output changes to a value which identifies the location of the terminal.

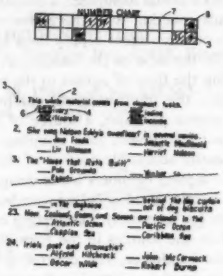
4,514,177

INVISIBLE INK QUIZ GAME

Leon G. Lenkoff, Louisville, Ky., assignor to Stry-Lenkoff Co., Louisville, Ky.

Filed Jan. 23, 1984, Ser. No. 572,882
Int. Cl.[3] G09B *3/06*; A63F *9/18*
U.S. Cl. 434—328 **13 Claims**

1. A quiz game device including a first defined area with a number of questions and associated specific identifying indicia visibly set forth thereon, each question having at least two visibly marked selectable answers with chemically treated invisibly marked designations adjacent thereto to indicate correctness of the answer selected and responded to by a player when marked visible; a chemically treated marking means to mark said answers visible, and a second defined area having random chance selection means in the form of a number of randomly marked invisible identifying indicia which, when marked visible with said marking means, serve to expressly



designate specifically the correspondingly specific visible identifying indicia of the question to be responded to by a player.

4,514,178

METHOD AND APPARATUS FOR COORDINATION OF GARMENTS

Peter Noto, Staten Island, and Michael Reid, New York, both of N.Y., assignors to Garan, Inc., New York, N.Y.

Continuation of Ser. No. 366,178, Apr. 7, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 551,112
Int. Cl.[3] G09B *25/00*
U.S. Cl. 434—395 **11 Claims**

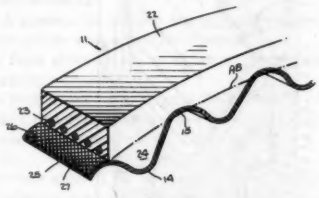
1. Apparatus for coordination of one or more members of a first set of garments with one or more members of a second set of garments by the visual characteristics thereof, each of the garment sets comprising a plurality of members, at least some of which have different visual characteristics from others, said apparatus comprising first and second sets of marking bearing devices, a different one of the devices in said first device set being associated with each member of the first garment set, a different one of the devices in said second device set being associated with each member of the second garment set, each of said devices in said first device set bearing a single marking from a set of markings comprising a plurality of different markings, all of said devices in said second device set bearing each of said markings in said marking set, and means, associated with each of said devices in said second device set, for designating one or more of said markings thereon, said designated markings corresponding to a subset of said devices in said second device set which bear the same marking as the designated marking, each of the members of the first garment set associated with a device in said subset of devices coordinating with the member in said second garment set associated with the device of said second device set bearing said designated marking.

4,514,179

POWER TRANSMISSION BELT WITH FABRIC COVER

William A. Skura, New Haven, Conn., assignor to Uniroyal, Inc., Middlebury, Conn.

Filed Mar. 2, 1983, Ser. No. 471,923
Int. Cl.³ F16G 1/28
U.S. Cl. 474—204 12 Claims



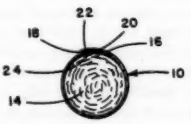
1. A positive drive power transmission belt having an elastomeric body portion, a tensile band embedded in the body portion, a plurality of teeth of elastomeric material integral with the body portion and each possessing a predetermined spring rate, said teeth being positioned along a peripheral surface of the belt, and a fabric cover formed over the teeth and over the land portions between the teeth, said fabric comprising warp and weft yarns and locking means cooperating with said warp and weft yarns for substantially locking them with respect to each other at the intersections thereof for dimensionally substantially stabilizing said fabric, said locking means at least partially obstructing the interstices of said fabric whereby said interstices are substantially free of said elastomeric material, said fabric cover cooperating with said teeth such that the spring rate of each fabric covered tooth is greater than 1.2 times and less than 3 times the spring rate of such tooth alone.

4,514,180

METHOD OF MAKING FILTER FOR A CIGARETTE PRODUCT

Kurt A. Manecke, Valley Station, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 254,804, Apr. 16, 1981,. This application Jul. 6, 1982, Ser. No. 395,428
Int. Cl.³ A24C 5/50
U.S. Cl. 493—41 2 Claims



1. A method of making a cylindrical filter for a cigarette product comprising the steps of:

applying spaced parallel lines of a hot melt adhesive along opposite longitudinal portions of and to the same surface of a web of porous filter wrap material having a width slightly greater than the circumference of the cylindrical filter the distance between said spaced parallel lines of adhesive being substantially equal to the circumference of said filter rod;

adding a cylindrical filter plug to the web of filter wrap material so that the surface of the web having said adhesive lines is contiguous to the cylindrical filter plug; and,

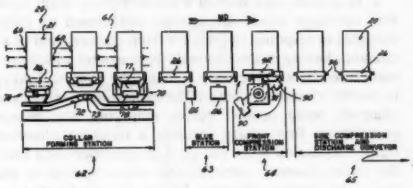
forming the web of filter wrap around the filter plug and overlapping the longitudinal edges of the web whereby one of said lines of adhesive is disposed between the overlapping longitudinal edges of the web of filter wrap securing the overlapping longitudinal edges of the web of filter wrap together and the other line of adhesive is disposed between the web of filter wrap and the filter plug superimposed with the first line of adhesive thereby anchoring the filter wrap to the filter plug.

4,514,181

APPARATUS FOR FORMING A FLIP TOP CARTON

Charles C. Hughes, Villa Hills, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Sep. 15, 1983, Ser. No. 532,455
Int. Cl.³ B31B 1/62
U.S. Cl. 493—131 9 Claims



1. Apparatus for forming the top portion of a flip top carton having interconnected front and side flaps and a separate rear flap, said front and side flaps being transversely creased or scored to present a lower section foldable on the top portion of the carton, a middle section foldable on said lower section, and a glue flap, said apparatus comprising,

a transport conveyor for carrying a plurality of cartons erected to a tubular form, and aligned so that the longitudinal axis of each carton is transverse to the conveying direction,

a forming conveyor parallel to said transport conveyor for carrying a plurality of formers each engageable with the top of a respective carton,

cam means associated with said forming conveyor for moving said formers toward and away from said cartons,

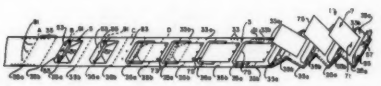
each said former having surfaces engageable with said middle and lower sections of a carton to fold said lower sections upon the top portion of said carton and to fold said middle section on said lower section.

4,514,182

METHOD OF AFFIXING ENVELOPES AND LETTERHEADS TO A CARRIER SHEET AND ASSEMBLY FORMED THEREBY

H. Richard VerMehren, 1395 Yaqui Dr., Florissant, Mo. 63031

Filed Dec. 13, 1982, Ser. No. 449,519
Int. Cl.³ B31B 1/90
U.S. Cl. 493—216 8 Claims



7. A method for affixing envelopes and letter sheets to a continuous carrier sheet having a plurality of panels in such a manner that the envelopes and letter sheets alternate and are continuously shingled, each of said envelopes comprising a body part and a closure flap connected to the body part along a closure flap fold, said method comprising a step of affixing envelope flaps and letter sheets to the same specific panels of the carrier sheet and on the same side of said carrier sheet so that said letter sheets are affixed to said panels at a position not covered by said envelope bodies, with said envelopes in an open position, and a step of closing said envelopes without removing said envelopes from said carrier sheet by folding and turning said envelope bodies about said closure flap folds

thereby overlapping said letter sheets when in said closed position.

4,514,183

CENTRIFUGE WITH SELF-EMPTYING DRUM

Werner Kohlstette, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

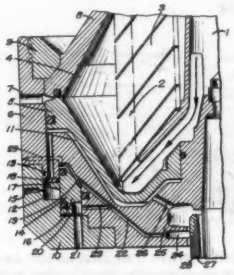
Filed Mar. 2, 1983, Ser. No. 471,419

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208808

Int. Cl.[3] **B04B** *11/02*

U.S. Cl. 494—27 **3 Claims**

1. In a centrifuge having a self-emptying drum with expulsion openings which are opened and closed by piston slide movable in response to pressure from closure fluid in a closure chamber having outlet channels therearound which are opened and closed by a valve body actuated by control fluid received in control chambers thereof, the expulsion openings and outlet channels being opened during emptying, the improvement comprising: first means forming a blocking chamber fluid-tightly separated from the control chambers and into which the outlet channels communicate when opened by the valve body, the blocking chamber having throttled outlets and configured to accommodate a part of the closure fluid from the closure chamber; and second means for supplying closure fluid to the closure chamber during emptying to effect a blocking of the outlet channels by the closure fluid in the blocking chamber to initiate a closing motion of the piston slide upon a reduction in pressure in the drum; whereby an opening motion of the



valve body initiates an opening motion of the piston slide for partial opening with the valve body maintained in an open position during partial emptying and closed after the piston slide has reached a closing position.

4,514,184
LEATHER TREATMENT COMPOSITION AND LEATHER TREATING

John A. Thompson, Milwaukee, Wis., assignor to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 374,577, May 3, 1982, Pat. No. 4,491,645.
This application Nov. 9, 1984, Ser. No. 670,529
Int. Cl.[3] C14C *3/22, 9/00, 9/04*
U.S. Cl. 8—94.21 11 Claims

1. A process for treating leather comprising contacting the leather article with a mixture comprising:

(a) from about 0.15% to about 1.25% by weight aliphatic cyclic anhydride;

(b) from about 1.5 to about 4.5% by weight of a vinyl acrylate copolymer having free carboxyl groups and a glass transition temperature of from about 35° C. to about 45° C.;

(c) from about 1.5% to about 4.5% of a vinyl acrylate copolymer having free hydroxyl groups and a glass transition temperature of from about 15° to about 22° C.;

(d) from about 88% to about 96% by weight of water; and

(e) a sufficient amount of base to maintain an alkaline pH, thereby coating said article, followed by heating the coated article.

4,514,185
FABRIC WASHING PROCESS AND DETERGENT COMPOSITION FOR USE THEREIN

Robert S. Lee, and Reginald V. Scowen, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,395
Claims priority, application United Kingdom, Jun. 18, 1981, 8118802
Int. Cl.[3] B08B *3/00, 3/08*
U.S. Cl. 8—137 8 Claims

1. A method of washing fabrics in water containing calcium hardness, comprising:

(a) contacting the fabrics with a wash liquor to which has been added at least:

(i) a synthetic detergent active material;

(ii) an alkali metal carbonate as a primary detergent builder material; and

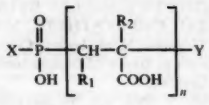
(b) subsequently effectively contacting the wash liquor with a secondary detergency builder, at or after the wash liquor has reached the critical state and adding the secondary detergency builder in such an amount as to reduce the free calcium ion concentration in the wash liquor to about 10^{-5} or less within at most 60 minutes from the addition of the alkali metal carbonate to the hard water, the amount of the secondary builder being insufficient in the absence of said carbonate, to reduce the free calcium ion concentration to less than about 10^{-5} molar.

4,514,186
AQUEOUS FORMULATIONS OF WATER-INSOLUBLE OR SPARINGLY WATER-SOLUBLE DYES AND HYPOPHOSPHITE/UNSATURATED ACID TELDMER

Alain Lauton, Saint-Louis, France, and Zdenek Koci, Binningen, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

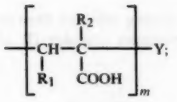
Filed Oct. 25, 1983, Ser. No. 545,416
Claims priority, application Switzerland, Apr. 11, 1982, 6415/82
Int. Cl.[3] C09B *67/40;* D06P *1/52*
U.S. Cl. 8—527 8 Claims

1. An aqueous dyestuff formulation comprising at least one water-insoluble or sparingly water-soluble dye, an anionic dispersant, as well as optionally further ingredients, which formulation contains at least one telomer of the formula I



(I)

or a salt thereof, wherein X is hydrogen or



Y is hydrogen, $-SO_4H$ or

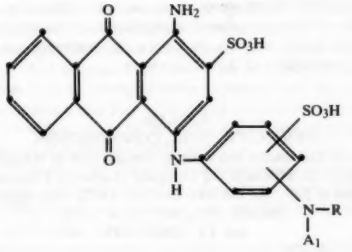
each of R_1 and R_2 independently of the other is hydrogen, C_1-C_4 alkyl which is unsubstituted or substituted by a carboxyl group or is carboxyl; and the sum of n+m is an integer from 2 to 350.

4,514,187
PROCESS FOR DYEING DIFFERENTIAL-DYEING POLYAMIDE FIBRES

Hans U. Schütz, Basle; Helmut Raisin, Riehen, and Th s Bouwknegt, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,596
Claims priority, application Switzerland, Jul. 21, 1982, 4450/82
Int. Cl.[3] C09B *1/34;* D06P *3/06*
U.S. Cl. 8—531 33 Claims

1. A process for the differential dyeing of polyamide fibers or mixtures of polyamide fibers which have components of different dyeability, comprising the step of applying to said fibers an aqueous liquor which contains a disulfo dye of the formula



in which A_1 is hydrogen or C_{1-4}-alkyl and R is C_{2-5}-alkanoyl, C_{3-6}-alkenoyl, phenoxycarbonyl, C_{1-4}-alkylsulfonyl or phenylsulfonyl, the alkyl, alkenyl, alkoxy, phenoxy or phenyl moieties of which are unsubstituted or substituted.

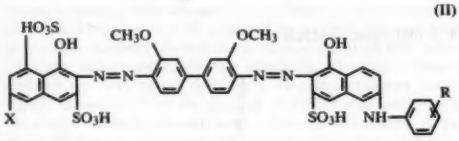
4,514,188
USE OF DISAZO-COPPER COMPLEX DYESTUFFS FOR DYEING NATURAL AND SYNTHETIC MATERIALS

Martin Michna, and Hermann Henk, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,686
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239509
Int. Cl.³ C09B *45/28*; D06P *1/10*; D21H *1/46*
U.S. Cl. 8—641 7 Claims

1. A process for dyeing cellulose fibre material wherein the dyestuff is a mono-copper complex (I) of a dyestuff of the formula II

(II)



wherein

X is SO_3H and

R is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, carboxyl, halogen or sulpho,

or of a mixture thereof with a bis-copper complex (III) of a dyestuff of the formula (II), wherein the total mixtures contain up to 50% by weight of (III).

4,514,189
CARBONACEOUS MATERIALS WATER MIXTURES

John G. Papalos, Ledgewood, and Joseph V. Sinka, Mendham, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Feb. 24, 1983, Ser. No. 469,168
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 12 Claims

1. A water slurry of solid particulate carbonaceous materials having present a condensate which is a condensation product of

(a) an aldehyde having from about 1 to about 7 carbon atoms,

(b) a benzene derivative selected from the group consisting of benzene sulfonic acid, an alkyl benzene sulfonic acid having at least one alkyl group of from about 1 to about 20 carbon atoms and mixtures thereof, and optionally

(c) a naphthalene derivative selected from the group consisting of naphthalene sulfonic acid, an alkyl naphthalene sulfonic acid having at least one alkyl group of from about 1 to about 12 carbon atoms and mixtures thereof,

the condensate being present in an amount sufficient to reduce viscosity of the water slurry, to stabilize carbonaceous materials in the water network, to form a soft sediment and to improve pumpability of the water slurry.

4,514,190
SYNTHETIC FUEL COMPOSITION

Thomas J. Cousineau, and John A. Cengel, both of Wheaton, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

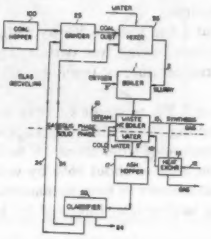
Division of Ser. No. 436,443, Oct. 25, 1982,. This application Jan. 16, 1984, Ser. No. 571,376
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—70 4 Claims

1. A two-cycle engine fuel composition comprising a liquid hydrocarbon of gasoline boiling range in admixture with a lubricant which comprises di-n-hexyl 1,3-cyclohexanedicarboxylate, wherein the ratio by weight of gasoline hydrocarbon to lubricant is from about 15:1 to about 100:1.

4,514,191
SLAG REMOVAL APPARATUS

Josef Langhoff, Dinslaken-Hisfeld, and Jürgen Seipenbusch, Essen, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany

Division of Ser. No. 216,826, Dec. 15, 1980, Pat. No. 4,425,254. This application Sep. 27, 1982, Ser. No. 424,639
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828562
Int. Cl.³ C10J *3/52*
U.S. Cl. 48—77 27 Claims

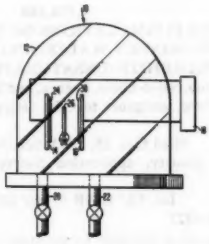


1. An apparatus for the removal of slag particles evolving in a coal-gasification process including a reactor with coal inlet means and oxygen containing gas inlet means located at the top of said reactor for reaction of coal with a gasification medium at predetermined reactive pressure and temperature levels located above a water bath means contained at the bottom of said reactor, means for removing the generated gas from said reactor above said water bath means, wherein said slag particles collect by free-fall through said water bath means to the bottom thereof, said apparatus comprising: a water bath means located substantially at a bottom region of said reactor; annular duct means connected to a source of oil additive agent and having nozzles positioned for spraying the additive agent transversely of a fall trajectory of said slag particles for wetting the slag particles and causing the slag particles to stick to one another, said spraying means being substantially in a region of said water bath means, the apparatus including a water duct means located superjacent to said annular means for feeding water to said water bath means; and means connected at the bottom of said water bath means for removing the collected slag particles.

4,514,192
SILICON OXIDE LAPPING COATINGS

Surendra K. Verma, Carmel, and George A. Kim, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 27, 1982, Ser. No. 402,379
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—295 11 Claims



1. In a lapping disc comprising a substrate and an SiO_x lapping coating thereon, where $1 \leqq x \leqq 2$,

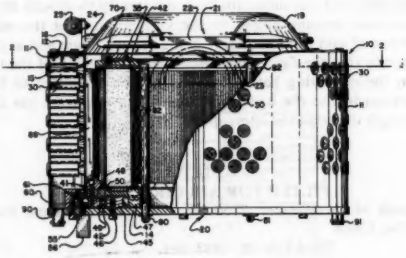
the improvement wherein the SiO_x coating contains a dopant selected from the group consisting of boron and phosphorous in an amount sufficient to enhance the micromachining abilities of said coating.

4,514,193

SELF-CLEANING AIR CLEANER ASSEMBLY WITH ROTATING FILTER ELEMENT AND INERTIAL PRE-CLEANER

Donald S. Booth, Burnsville, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jul. 26, 1984, Ser. No. 634,462
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—290 **12 Claims**



1. An air cleaner assembly comprising:

a plurality of wall members defining a cylindrical filter element chamber having an outlet port and a scavenging air chamber;

a plurality of inertial tube pre-cleaners supported in said air chamber for receiving air to be filtered from outside the filter, separating solid materials from said air, and delivering separated air to said element chamber;

a scavenging air outlet port formed through one of said wall members and adapted to be coupled to a negative pressure source for drawing scavenged air and solid materials intermixed therewith from said scavenging air chamber;

a cylindrical barrier filter element concentrically disposed in said element chamber with the interior of said filter element in fluid communication with said outlet port;

turntable and seal means for supporting said filter element for rotational movement and for sealing said filter element to prevent the leakage of separated air around said filter element and out of said outlet port;

air nozzle means disposed on the interior side of said filter element with its axis substantially parallel to the axis of the filter element and in close proximity to said filter element, said nozzle connectable to a source of pressurized air for directing a reverse flow of air through said filter element to dislodge filtered particles accumulated on said filter element; and

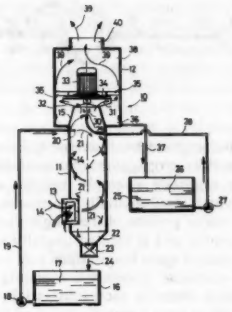
means providing a port between said filter element chamber and said scavenging air chamber to provide a fluid path from said filter element chamber to said scavenging air chamber whereby dislodged particles are carried away from the outward surface of said filter.

4,514,194

APPARATUS AND METHOD FOR REMOVING GASEOUS COMPONENTS AND/OR SOLID IMPURITIES PRESENT IN A GASEOUS FLUID FLOW

Viljo J. Järvenpää, Vellamontie 21 as. 6, 04200 Kerava, Finland

Continuation-in-part of Ser. No. 409,533, Aug. 19, 1982, Pat. No. 4,478,616. This application Sep. 20, 1983, Ser. No. 533,961
Int. Cl.³ B01D *47/06, 47/12*
U.S. Cl. 55—91 **14 Claims**



1. Apparatus for removing gaseous components and/or solid impurities from a gaseous fluid flow, comprising:

a pre-purification section for the pre-purification of the gaseous fluid flow including a pre-purification chamber, inlet means through which the gaseous fluid flow is introduced into said pre-purification chamber, outlet means through which the pre-purified gaseous fluid flow is discharged from said pre-purification chamber, and first scrubbing liquid means for conducting a first scrubbing liquid into contact with the gaseous fluid flow to pre-purify the latter;

a fine-purification section for the fine-purification of the pre-purified gaseous fluid flow discharged from said pre-purification section, said fine-purification section including a fine-purification chamber, scrubber means disposed in said fine-purification chamber, and outlet means through which the fine-purified gaseous fluid flow is discharged from said fine-purification chamber;

flow passage and accelerating means for conducting the pre-purified gaseous fluid flow from said pre-purification section directly to said scrubber means of said fine-purification section and for accelerating the pre-purified gaseous fluid flow prior to the latter reaching said scrubber means of said fine-purification section;

means for conducting a second scrubbing liquid into contact with the pre-purified gaseous fluid flow as the latter is accelerated in its conduction to the scrubber means of said fine-purification section; and

said scrubber means include impeller means for accelerating a total fluid flow comprising the second scrubbing liquid flow from said second scrubbing liquid conducting means and the pre-purified gaseous fluid flow to higher velocities and for separating droplets of the second scrubbing liquid from the total fluid flow.

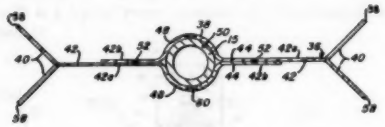
4,514,195
DISCHARGE ELECTRODE

Everett L. Coe, Jr., Downey, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 192,589, Oct. 1, 1980, abandoned, which is a continuation of Ser. No. 946,925, Sep. 28, 1978, abandoned, which is a division of Ser. No. 788,171, Apr. 18, 1977, abandoned. This application Apr. 25, 1984, Ser. No. 603,978

Int. Cl.³ B03C *3/41*

U.S. Cl. 55—132 **16 Claims**



1. A discharge electrode assembly for use in an electrostatic precipitator for propagation of corona discharge wherein said discharge electrode assembly includes an elongated support portion which is substantially longitudinally coextensive with at least a major portion of the longitudinal extent of said electrode assembly and is located laterally intermediate a pair of laterally spaced apart longitudinal side portions of said assembly, said electrode assembly comprising: a pair of elongated formed body elements each substantially longitudinally coextensive with at least a major portion of the longitudinal extent of said electrode assembly; each of said body elements including a pair of laterally spaced apart edge portions longitudinally coextensive therewith and an elongated formed intermediate portion substantially coextensive therewith and spaced laterally from at least one of said pair of edge portions; said pair of body elements being maintained in mutually juxtaposed laterally overlapping relationship with respect to each other to form said electrode assembly in a manner that one of said edge portions of each said body element extends laterally outward of the overlapping portions of said body elements to form the laterally outermost extent of a respective one of said side portions and the respective formed intermediate portions of said body elements cooperate to form said elongated support portion; and at least one of said body elements including longitudinally extending corona discharge means formed integrally therewith adjacent the respective said one edge portion thereof and spaced laterally from said elongated support portion, said discharge means extending at least a major portion of the longitudinal extent of said electrode assembly.

4,514,196
ABSORPTION TOWER FOR GAS WASHING

Bo Herrlander, Växjö, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

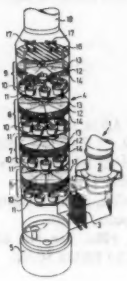
Filed May 6, 1983, Ser. No. 492,357

Claims priority, application Sweden, May 10, 1982, 82029208

Int. Cl.³ B01D *47/10*

U.S. Cl. 55—223 **5 Claims**

1. An absorption tower for gas washing having upstanding walls defining a vertical flow passage in which the gas flows, a gas inlet in the lower portion of the tower, and an outlet at the top, so that the gas flows upwards through the passage while making contact with washing fluid, the tower being provided with at least two transverse baffles extending between the walls to prevent downward flow of washing liquid in the tower through or past the baffles to define at least two washing stages, each stage comprising at least one restricted tube extending upright through the baffle through which the gas is subjected to a speed increase, supply means including a fluid nozzle in the gas flow path for discharging washing fluid into the gas exhausted from the restricted tube, any fluid which is not entrained in the upwardly flowing gas passing through the gas and onto the baffle, the tube in each washing stage projecting above the baffle at a height to cause the baffle to collect a body of the washing fluid on the baffle, and drain means to discharge the washing fluid from the body of fluid on the baffle and a conduit to recirculate the washing fluid from the baffle to the fluid nozzle, said supply means being positioned adjacent the upper portion of said tube and constructed and arranged to discharge the recirculated washing fluid into



the exhausted gas substantially concurrently therewith and in directions forming angles to the vertical, at least the major portion of said fluid discharge being at such angle and at such velocity that the fluid passes past the top opening of the tube into the collecting baffle and will not be permitted to flow backwards into the opening of the tube even if the gas flow through the tower is interrupted.

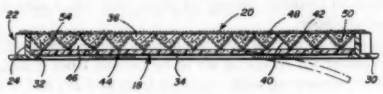
4,514,197
FILTER FOR AIR CIRCULATOR

Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Feb. 15, 1983, Ser. No. 467,074

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—316 **2 Claims**



1. A filter for use with an air circulator having an airflow passage, said filter comprising a frame, a pair of screens having peripheral portions connected to the frame to form an enclosure with the main portions of the screens being spaced apart to form a space, at least one screen being corrugated with alternate crests being disposed upstream and downstream of the airflow, and a layer of activated carbon filling the space between the screen with the carbon conforming with the corrugations to increase the surface area exposed to the airflow, said downstream screen being flat, said corrugated screen having alternate crests adjacent the flat screen, said corrugated screen having V-shaped corrugations to define a plurality of areas filled with filter material of triangular cross sectional configuration with the apexes upstream, thereby providing a filter with the thinnest areas of the filter being located at the points of adjacency of the flat screen and alternate crests of the corrugated screen, said frame including an inwardly extending flange in spaced overlying relation to the upstream apexes of the corrugated screen, and a prefilter in the form of a panel of flexible, resilient foam plastic material engaging the apexes of the corrugated screen remote from the flat screen with the periphery of the resilient panel being inserted under the inwardly extending flange on the frame to prefilter air entering the airflow passage prior to it engaging the activated carbon

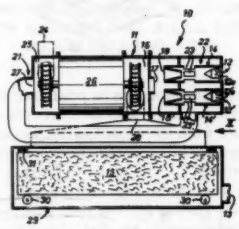
with the inwardly extending flange retaining the prefilter panel in place and the flexibility of the foam plastic enabling the prefilter panel to be removed so that particulate material removed from the air by the prefilter panel can be easily washed from the foam material by holding it under running water or squeezing it while immersed in water or other cleaning solution, said triangular areas of activated carbon providing a maximum surface scrub area and providing equal static pressure along the inner surface of the prefilter to assure that air will scrub over the entire corrugated surface of the activated carbon with the evenly distributed air passing through the prefilter traveling down the sides of the triangular areas of the activated carbon and scrubbing against such surfaces while maintaining a low static pressure requirement to move air through the carbon material at the areas in which the corrugated screen crests are disposed adjacent the flat screen.

4,514,198

APPARATUS FOR PRESSURIZATION AND FILTRATION OF CONTAMINATED AIR

Guy Develle, Domont, and Gerard Martin, La Garenne-Colombes, both of France, assignors to Sofiltra Poelman, La Garenne-Colombes, France

Filed Mar. 8, 1983, Ser. No. 473,613
Claims priority, application France, Mar. 8, 1982, 82 03818
Int. Cl.³ B01D 50/00
U.S. Cl. 55—337 **9 Claims**



1. In an apparatus for the pressurization and filtration of contaminated air, comprising at least one dust separator having a contaminated air inlet and a dust outlet and an air outlet, at least one filter in flow communication with said air outlet so as to receive air from said air outlet, a first blower positioned and arranged for forcing the latter air through the at least one filter, a second blower in flow communication with said dust outlet so as to receive dust from said dust outlet and evacuates the latter dust from the apparatus; the improvement comprising a single driving device, said first and second blowers being coupled to said single driving device at either side thereof, the intake of at least one of said first and second blowers being positioned and arranged close to one of said air outlet and dust outlet.

4,514,199

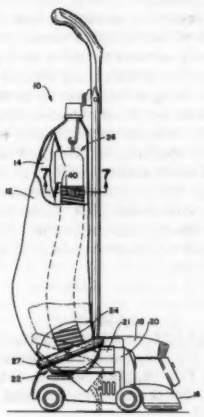
VACUUM CLEANER DIRT BOX

Roger S. Ford, North Ridgeville; Herman J. Shie, III, Elyria, both of Ohio, and Thomas E. Baird, Sr., Springfield, Ill., assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed May 25, 1984, Ser. No. 614,261
Int. Cl.³ B01D 50/00
U.S. Cl. 55—337 **5 Claims**

1. In an upright vacuum cleaner having a blower and a blower outlet tube, a dirt-collecting box comprising a top wall which slants downwardly in the lengthwise direction in the normal position of use of the box, a side wall which is elliptical in shape where it is adjacent said top wall, a bowl-shaped permanently closed bottom wall, said walls defining a dirt box chamber, an inlet neck connected to said blower outlet tube and opening through said bowl-shaped bottom wall into the chamber in the lengthwise direction and spaced below one end of the top wall, said opening of the inlet neck into the chamber being spaced downwardly from said one end of the top wall by said elliptical portion of said side wall, the center of said inlet neck being aimed in a lengthwise direction but to one side of the center of the chamber and also being aimed convergently toward said downwardly slanting top wall, and a laterally centered outlet port in the top wall, the center of said outlet port being longitudinally offset from the center of the top wall toward the end thereof associated with said one end of the top wall whereby air passes through said dirt box with a swirling motion and heavy objects are caught within said chamber and separated with relatively little turbulence of the passing air, said chamber being emptyable by disconnection of said inlet neck from said blower outlet tube and downward tilting of said neck for emptying of said chamber therethrough.

4. A dirt-collecting box for an upright vacuum cleaner comprising a chamber having a top wall which slants downwardly from front to back in the normal position of use of the box, said chamber also having a side wall which is elliptical in shape where it is adjacent said top wall, said elliptical shape being divided into symmetrical lateral halves by a first imaginary plane of symmetry passing through the long axis of the elliptical shape and being divided into symmetrical front and back halves by a second imaginary plane of symmetry passing through the short axis of the elliptical shape, lower portions of said side wall fairing into a bowl forming a bottom wall for the chamber, an outlet port in the top wall, said outlet port being generally symmetrical with respect to said first imaginary plane of symmetry, the central axis of said outlet port being offset forwardly of said second imaginary plane of symmetry but generally parallel thereto, an inlet neck extending into said bowl from the front end thereof, the central axis of said inlet neck forming an acute angle with its own projection on said second plane, said last-named axis being offset from said first imaginary plane of symmetry but generally parallel thereto.



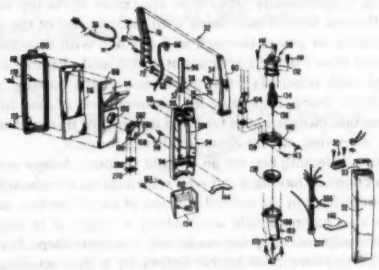
5. In an upright vacuum cleaner, a fill tube leading from the outlet of a dirt box to a connection to a disposable bag, said outlet including a threaded outlet collar at the outlet port of the dirt box, said fill tube comprising a helically ridged and grooved flexible plastic tube having one end engaging the threading of the collar along at least part of the length of the collar, said threading having a generally flat crest with a relatively sharp crest edge on the side of the thread that faces the dirt box and a relatively rounded crest edge on the opposite side of the thread, said tube sealing to said sharp edge in the absence of a clamp or cable tie.

4,514,200

FILTER BAG FOR FLOOR CARE APPLIANCE

William R. Sumerau, Easley, and Gordon E. Laing, Anderson, both of S.C., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 30, 1984, Ser. No. 605,098
Int. Cl.[3] B01D *46/02*
U.S. Cl. 55—368 2 Claims



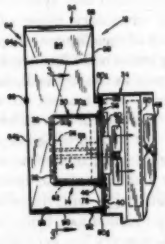
1. A filter bag comprising filter sheet material configured into a single elongate tubular form with substantially flat opposing walls and accordion pleated portions joining said walls, the opposite ends of said elongate tubular form being folded, said end folds being secured to define air impermeable seals, one of said flat opposing walls being formed with two spaced apertures, the first being an inlet opening arranged inwardly of one of said end folds, a second of said spaced apertures being arranged generally midway between said end folds and inwardly of said first aperture, said elongate tubular form being folded upon itself along a transverse line bisecting said second of said spaced apertures with said apertured wall arranged with confronting contiguous plies inside the folded tubular form, and means sealing said confronting contiguous plies of said apertured wall together surrounding said folded upon itself second aperture.

4,514,201

AIR INTAKE ANTI-FOULING STACK

Duane G. Brown, 812 SW. Carden, Pendleton, Oreg. 97801

Filed Feb. 18, 1983, Ser. No. 467,768
Int. Cl.[3] B01D *46/24, 46/48;* B60K *11/04*
U.S. Cl. 55—385 B 3 Claims



1. An anti-fouling, air intake stack for use on a combine having an engine, a housing enclosing the engine including a vertical portion having an aperture through which air travels for cooling the engine, and a rotary screen air-filtering basket mounted on the vertical portion and extending outwardly around the periphery of the aperture, said stack comprising:

a vertical, single-chambered box having an open top, and an open bottom, said box including a member positioned and arranged to be selectively movable between a first position closing said bottom and a second position in which the bottom is at least partially open, and vertical sides attached to and extending from the bottom,

including one side with an opening disposed adjacent said bottom and sized to allow passage of the basket freely therethrough, said one side being fixedly mountable on the vertical portion so as to allow the basket to extend through the side opening,

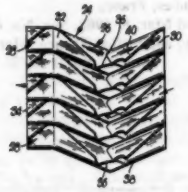
said box being sized to receive internally, entirely and unobstructedly the basket when said one side is mounted on the vertical portion.

4,514,202

AIR STREAM ENTRAINED WATER ELIMINATOR FOR CROSS FLOW COOLING TOWER

Ohler L. Kinney, Jr., Leawood, and Joyce D. Holmberg, Overland Park, both of Kans., assignors to The Marley Cooling Tower Company, Mission, Kans.

Continuation of Ser. No. 488,096, Apr. 25, 1983, abandoned.
This application Sep. 12, 1984, Ser. No. 649,617
Int. Cl.[3] B01D *45/16*
U.S. Cl. 55—440 6 Claims



1. A drift eliminator adapted to be positioned in a crossflow cooling tower between the fill assembly and outlet chamber for removing moisture from the crossflowing, moisture-laden air exiting the fill assembly in a generally horizontal direction, said eliminator comprising:

a plurality on imperforate, spaced, aligned, upright wall members each having first, second and third angularly interconnected generally parallel, planar panels;

a plurality of upright, corrugated wall elements, each corrugated element being secured between adjacent wall members and having first, second and third angularly interconnected panels of longitudinally serpentine configuration, said first, second and third serpentine panels being disposed adjacent respective first, second and third planar panels,

said serpentine panels forming peaks and valleys each of which has a linear extent, the linear extent of the peaks and valleys being at an angle with respect to adjacent zones of merger of the planar panels and the linear extent of the peaks and valleys of each of the serpentine panels being at an angle with respect to the linear extent of the peaks and valleys of the next adjacent serpentine panel;

each corrugated wall element having peaks and valleys and the respectively adjacent wall members cooperating to define spaces which present a plurality of generally vertically stacked, discrete air-receiving cells, each cell presenting inlet, intermediate and outlet diversion sections wherein

the spaces between the first serpentine panel of each corrugated wall element and the first planar panels of the adjacent wall members present a plurality of vertically stacked, elongated inlet air diversion sections longitudinally oriented upwardly in a first direction,

the spaces between the second serpentine panel of each corrugated wall element and the second planar panels of the adjacent wall members present a plurality of vertically stacked, elongated, intermediate diversion sections longitudinally oriented upwardly in a second direction different from said first direction,

the spaces between the third serpentine panel of each

corrugated wall element and the third planar panels of the adjacent wall members present a plurality of vertically stacked, elongated outlet diversion sections longitudinally oriented upwardly in a third direction different from said second direction; and

each corrugated wall element having a plurality of individual perforations extending therethrough and disposed in upright alignment, the perforations being located at the zones of merger of the first and second serpentine panels and in each of the peaks of the corrugations of said first and second serpentine panels, perforations being operable to clear moisture from the walls of each cell as the cross-flowing, moisture-laden air transits therethrough, the generally aligned perforations providing a downward moisture flow path through the cells for collecting moisture in the lowermost portion of the cooling tower.

4,514,203

CRYOGENIC PROCESS FOR REMOVING ACIDIC GASES FROM GAS MIXTURES

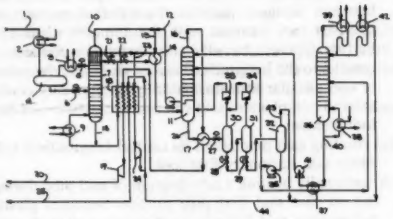
Luigi Gazzi, Milan; Giancarlo Cotone, S. Donato Milanese; Gianfraco Soldati, S. Donato Milanese; Alessandro Ginnasi, S. Donato Milanese; Alessandro Vetere, Milan, and Carlo Rescalli, S. Donato Milanese, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jun. 23, 1982, Ser. No. 391,282

Claims priority, application Italy, Jul. 23, 1981, 23081 A/81

Int. Cl.³ F25J *3/00, 3/02*

U.S. Cl. 62—17 **20 Claims**



1. A cryogenic process for removing acidic gases, such as H_2S and CO_2, from natural gas or syngas consisting the steps of:

(a) feeding the natural gas or syngas to a distillation column under a pressure of from 30 to 75 absolute atmospheres at a head temperature between −80° C. and −30° C. and a bottom temperature between −7° C. and +50° C.;

(b) feeding the partially purified gas exiting from the distillation column with a solvent for selective absorption of acidic gases, the solvent being selected from the group consisting of methyl formate, methyl acetate, ethyl acetate, tetrahydropyran, 1,3-dioxolane, tetrahydrofuran, methyltetrahydrofuran, 1,2-dimethoxyethane, 1-methoxyethanol, 2-methoxyethylacetate and dimethoxydiethyleneglycol and mixtures thereof; to an absorption column under the same pressure as the distillation column and at a temperature between −100° C. and −10° C. to further reduce the acidic gas content to a desired level;

(c) regenerating the spent solvents from said absorption column by one or more expansion stages to recover the solvents;

(d) removing the acidic gases by one or more additional expansion stage; and

(e) recycling the recovered solvents to said absorption column.

4,514,204

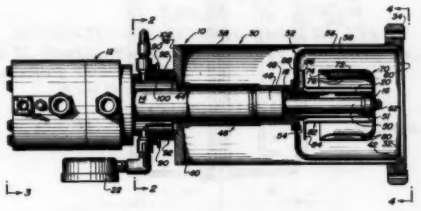
BAKEABLE CRYOPUMP

Glenn E. Bonney, and Ralph C. Longsworth, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 21, 1983, Ser. No. 477,478

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—41 **14 Claims**



1. A bakeable cryopump comprising in combination:

a flange designed for mounting said cryopump to a vacuum chamber normally operated at vacuums of 10^{-10} torr or below; a generally cylindrical refrigerator housing fixed to said flange, said refrigerator housing designed and arranged to receive a two-stage displacer-expander refrigerator head so that a coldest stage of said refrigerator head can be brought in thermal contact with a closed end of said refrigerator housing said refrigerator removable from said housing without loss of vacuum inside said cryopump, said refrigerator housing further designed and arranged in combination with a thermal transfer media contained in said housing at approximately 1 atmosphere pressure to thermally contact a warmer stage of said refrigerator; at least one cryopanel fixed to said closed end of the refrigerator housing said cryopanel including means to minimize radiant heat loads and to cryopump hydrogen, said housing and said cryopanel fabricated from materials and by methods to minimize out-gassing of the structure under vacuum; said refrigerator head being designed to be readily removed from said refrigerator housing and said cryopump housing heated to temperatures above 200° C. under vacuum conditions to remove adsorbed gases from said cryopanel.

4,514,205

FIBER COOLING APPARATUS

Charles M. Darcangelo, Corning; Max R. Montierth, Elmira, both of N.Y., and Yang-Chou M. Ni, Lexington, Ky., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 318,374, Nov. 5, 1981,. This application Mar. 9, 1984, Ser. No. 587,816

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—12 **7 Claims**

1. In an apparatus for drawing a single optical fiber comprising, in order of relative location:

a solid glass preform having at one end thereof a softened root portion wherein the preform cross-sectional area tapers to the cross-sectional area of said single fiber,

means situated along said fiber below said root portion for measuring the diameter of said fiber,

means for cooling said fiber,

means for applying protective coating material to said fiber, and

means for drawing said fiber, characterized in that said means for cooling comprises

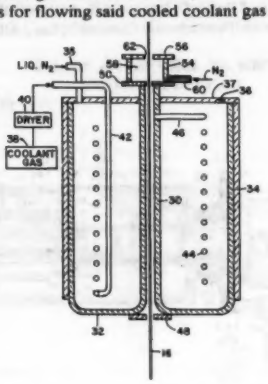
an elongated tube surrounding said fiber, the top of said tube being below said diameter measuring means,

means supplying coolant gas,

a reservoir in which said tube is centrally disposed, said reservoir containing liquified gas,

means for cooling said coolant gas prior to the time that said coolant gas reaches said tube, and

means for flowing said cooled coolant gas through said tube



and axially along that portion of said fiber within said tube whereby said fiber is cooled to a temperature that is sufficiently low that said fiber does not adversely affect said protective coating material.

4,514,206

METHOD FOR THE PRODUCTION OF A TRANSVERSE CORRUGATED OR SERRATED INTERIOR PIPE OF A DOUBLE-WALLED SPECIAL GAS DISCHARGE PIPE WITH HIGH ANGLE SELECTIVITY

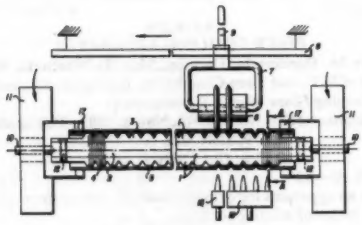
Udo Roselt, Lobeda-Ost; Lothar Nolte, Jena, and Manfred Pöhler, Halle-Neustadt, all of German Democratic Rep., assignors to VEB Kombinat Feinmechanische Werke Halle, Halle, German Democratic Rep.

Filed Jan. 5, 1984, Ser. No. 573,895

Claims priority, application German Democratic Rep., Apr. 11, 1983, 249730

Int. Cl.[3] **C03B** *23/04;* **B29C** *17/07*

U.S. Cl. 65—108 **20 Claims**



1. A method for the production of a substantially transversely deformed cylindrical pipe which comprises:

(a) providing a smooth-walled substantially rectilinear cylindrical pipe, said pipe being principally composed of a thermoplastic solid material;

(b) providing a first transformation tool, said first tool having a substantially rectilinear central shaft and a one-part transformation tool element, said one-part tool element being mounted to a portion of the outer surface of said central shaft, and being provided with a plurality of parallel substantially identical external recesses in its outer surface, said first tool being configured so as to fit within said pipe and extend longitudinally therethrough with a substantial clearance fit;

(c) inserting said first tool longitudinally into said pipe, so that said central shaft and said pipe are substantially coaxial, with said pipe being concentrically disposed about said central shaft and contiguously external to said one-part tool element;

(d) centrally mounting the opposed ends of said central shaft on first support elements, so that said first tool is rigidly and fixedly mounted on said first support elements, whereby said first tool is stationary, said first support elements being both longitudinally and transversely displaceable, said first tool being detachably mounted to said first support elements;

(d) mounting the opposed ends of said pipe on second support elements said second support elements being rotatable about the central longitudinal axis of said pipe, said pipe being detachably mounted to said second support elements;

(f) providing a second transformation tool, said second tool being external to and juxtaposed with said pipe, and aligned opposite to said one-part tool element, said second tool having a plurality of substantially circular and rotatable coaxially aligned dependent solid transformation elements, said circular transformation elements being substantially identical and of the same size with equal diameters, said elements being spaced apart and juxtaposed in registration, and being dependent from third support elements, so that said circular transformation elements are oriented substantially perpendicular to said pipe and are displaceable into contact with or spaced away from said pipe, and alternately displaceable parallel to the axis of said pipe when spaced away from said pipe, the spacing between adjacent pairs of circular transformation elements being substantially equal to the spacing between adjacent pairs of the external recesses in said one-part tool element, with the common central axis of said juxtaposed circular transformation elements being parallel to the longitudinal axis of said pipe, the perimeters of said circular transformation elements being configured so as to complement said external recesses in said one-part tool element;

(g) rotating said pipe about its central longitudinal axis, and about said stationary first tool;

(h) externally heating a first portion of said pipe during step (g), so that said first pipe portion becomes plastic and deformable, said first pipe portion being aligned with both said second tool and said one-part tool element;

(i) displacing said second tool towards said first pipe portion during step (h), so that each of said circular transformation elements extends into one of said external recesses in said one-part tool element and is pressed against said first pipe portion, and is rotated by static friction with the external surface of said first pipe portion, whereby said first pipe portion is transversely deformed, thereby forming a plurality of parallel substantially identical recesses in said first pipe portion;

(j) displacing said second tool away from said first pipe portion, and thereafter to a subsequent position in which said second tool is juxtaposed with a second pipe portion immediately adjacent to said first pipe portion;

(k) displacing said first tool transversely away from said first pipe portion, so that clearance is provided between said recesses in said first pipe portion and said one-part tool element, and thereafter both longitudinally followed by transversely, to a subsequent position in which said one-part tool element is contiguously juxtaposed with said second pipe portion;

(l) maintaining the heating of said first pipe portion;

(m) externally heating said second pipe portion, while maintaining the rotation movement of said pipe according to step (g), so that said second pipe portion becomes plastic and deformable;

(n) displacing said second tool towards said second pipe

portion during step (m), so that each of said circular transformation elements extends into one of said external recesses in said one-part tool element and is pressed against said second pipe portion, and is rotated by static friction with the external surface of said second pipe portion, and concomitantly guiding at least one of said circular transformation elements into one of the recesses previously formed in said first pipe portion according to step (i), and whereby said second pipe portion is transversely deformed, thereby forming at least one recess in said second pipe portion, said one recess being, parallel to and substantially identical with said recesses previously formed in said first pipe portion according to step (i);

(o) maintaining the heating of said first and second pipe portions, and any subsequent deformed pipe portions, which have been subsequently deformed seriatim, to form the requisite number of parallel and substantially identical recesses in and along said pipe;

(p) thereafter displacing said second transformation tool away from said pipe;

(q) terminating the heating of said pipe;

(r) subsequently removing said first transformation tool from within said pipe, thereby permitting the completed and substantially transversely deformed cylindrical pipe to cool in a tension-free environment; and

(s) removing said pipe from said second support elements, thereby recovering a product substantially transversely deformed cylindrical pipe having a plurality of spaced-apart parallel and substantially identical recesses in and along its length.

4,514,207

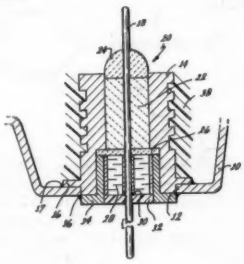
METHOD FOR MAKING TERMINAL ASSEMBLY FOR HEART PACEMAKER

James C. Kyle, 2547 Fisher Rd., Roseburg, Oreg. 97470, assignor to James C. Kyle, Roseburg, Oreg.

Division of Ser. No. 322,013, Nov. 16, 1981, Pat. No. 4,456,786, which is a continuation of Ser. No. 95,613, Nov. 19, 1979, abandoned. This application May 2, 1984, Ser. No. 606,394

Int. Cl.[3] C03C *27/02*; **H01B** *17/26*

U.S. Cl. 65—21.1 **9 Claims**



1. A method of forming insulating material for a terminal, including:

forming beads of a first insulating material having a partially crystalline and a partially amorphous composition from oxides of lead, boron and silicon and oxides of zinc and zirconium, where the oxides of lead, boron and silicon provide a flux,

forming beads of a second insulating material having a partially crystalline and a partially amorphous composition from the oxides of lead, boron and silicon and oxides of zinc and zirconium where the oxides of lead, boron and silicon provide a flux and the percentage of the flux in the second insulating material is greater than the percentage of the flux in the first material,

forming beads of a third insulating material having a partially crystalline and a partially amorphous composition from the oxides of lead, boron and silicon and oxides of zinc and zirconium and an inert material where the oxides of lead, boron and silicon provide a flux,

forming separate layers from the respective beads of the first, second and third insulating materials, and

applyng heat at a particular temperature for a limited period of time to fuse the beads of the first, second and third insulating materials.

4,514,208

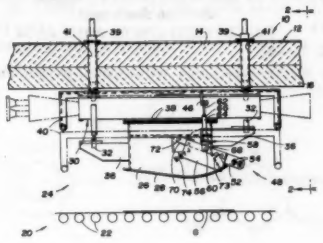
APPARATUS FOR BENDING GLASS SHEETS

Dean M. Nitschke, Maumee, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Filed Oct. 20, 1983, Ser. No. 543,916

Int. Cl.[3] C03B *23/035*

U.S. Cl. 65—273 **11 Claims**



1. In a glass sheet bending station including a conveyor for conveying glass sheets generally horizontally, and a holder assembly including a holder having a curved surface for receiving heated glass sheets from the conveyor, the improvement comprising:

a bending member mounted on the holder assembly for movement from a storage position located above the conveyor to a position below the curved surface and thereafter upwardly for engaging a heated glass sheet received by the holder from the conveyor to provide bending thereof to the curved shape of the holder surface.

4,514,209

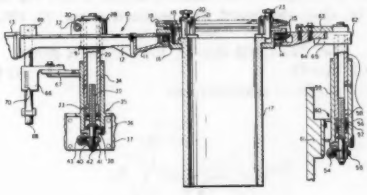
GLASS FEEDER TUBE SUPPORT

Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 1, 1983, Ser. No. 556,810

Int. Cl.[3] G03B *7/08*

U.S. Cl. 65—328 **6 Claims**



1. Apparatus for supporting a glass feeder tube in a feeder bowl, comprising a main horizontal frame having a circular opening therethrough, an annular bearing and ring mounted in said opening for supporting said feeder tube for rotation about its vertical axis, a drive motor mounted at one end of said frame, a drive shaft extending from said motor to said tube to said ring for rotating said tube, a first adjustable, vertical, support mounted to said feeder bowl and extending up to said frame, said support connected to said frame at one side of said

tube, a second adjustable vertical support mounted to said feeder bowl and extending up to and connected to said frame at a point on the opposite side of said tube, and means for adjusting the length of said supports in equal increments.

4,514,210

HERBICIDALLY ACTIVE METHYL-SUBSTITUTED TETRAHYDRO-2-PYRIMIDINONE DERIVATIVES

Masahiro Aya; Junichi Saito; Kazuomi Yasui, all of Tokyo, and Kozo Shiokawa, Kanagawa, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,696

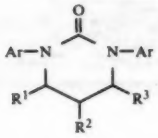
Claims priority, application Japan, Feb. 16, 1982, 57-22109

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.³ C07D *239/10*; A01N *43/54*

U.S. Cl. 71—92 **12 Claims**

1. A methyl-substituted tetrahydro-2-pyrimidinone of the formula



in which

Ar each independently is a phenyl or α-naphthyl group optionally substituted by at least one substituent selected from halogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy, C_1 to C_6 akylthio, nitro, phenoxy and trifluoromethyl, and

R^1, R^2 and R^3 each independently is a hydrogen atom or a methyl group, at least one of R^1, R^2 and R^3 being a methyl group.

4,514,211

BENZOFURAN AND BENZOTHIOPHENE SULFONAMIDES

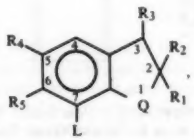
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 410,993, Aug. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 317,183, Oct. 16, 1981, abandoned. This application Apr. 27, 1983, Ser. No. 489,099

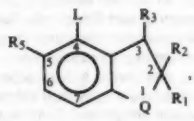
Int. Cl.³ C07D *405/12, 409/12*; A01N *47/36*

U.S. Cl. 71—92 **52 Claims**

1. A compound selected from:

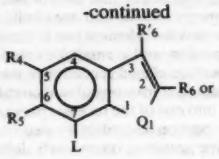


I

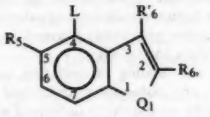


I'

-continued



II

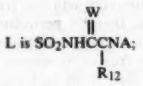


II'

wherein

Q is O, S, SO or SO_2;

Q_1 is O, S or SO_2



R_1 is H or C_1–C_4 alkyl;

R_2 is H or C_1–C_4 alkyl;

R_3 is H or CH_3;

R_4 is H, Cl, CH_3, CF_3, OCH_3, Br, F, SCH_3 or OCF_2H;

R_5 is H, CH_3, OCH_3, Cl, Br, NO_2, CO_2R_7, SO_2R_8, OSO_2R_9, $SO_2NR_{10}R_{11}$, F, CF_3, SCH_3, OCF_2H or $SO_2N(OCH_3)CH_3$;

R_6 is H, Cl, Br of C_1–C_4 alkyl;

R_6' is H, CH_3, Cl or Br;

R_7 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_8 is C_1–C_3 alkyl;

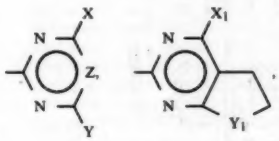
R_9 is C_1–C_3 alkyl or CF_3;

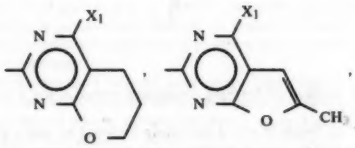
R_{10} and R_{11} are independently C_1–C_2 alkyl;

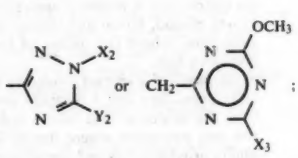
R_{12} is H or CH_3;

W is O or S;

A is

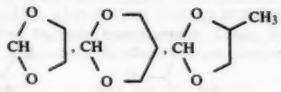






X is H, CH_3, OCH_3, Cl, F, OCF_2H or SCF_2H;

Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, $CH(OCH_3)_2$, $CH(OCH_2CH_3)_2$, C_2H_5, CF_3, $CH_2{=}CHCH_2O$,



$CH{\equiv}CCH_2O$, CF_3CH_2O, OCH_2CH_2Cl, OCH_2CH_2Br, OCH_2CH_2F, CN, $CH_2OCH_2CH_3$, $OCH_2CH_2OCH_3$ or GCF_2T wherein G is O or S and T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$;

Z is CH, N, CCH_3, CC_2H_5, CCl or CBr;

Y_1 is O or CH_2;

X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H;

X_2 is CH_3, C_2H_5 or CH_2CF_3;

Y_2 is C_2H_5, CH_3, OCH_3, OC_2H_5, SCH_3 or SC_2H_5; and

X_3 is CH_3 or OCH_3; provided that

(1) in Formulae II and II', when R_5 is NO_2, then R_6 is C_1–C_4 alkyl and R_6' is CH_3;

(2) when X is Cl or F, then Z is CH and Y is OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(3) when Q is SO, then W is O;

(4) when R_4 is other than H, then R_5 is H; and

(5) R_1 and R_2 taken together are not more than four carbon atoms.

4,514,212

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

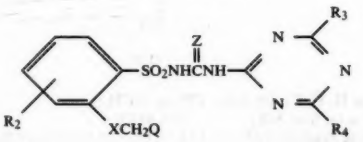
Continuation-in-part of Ser. No. 282,779, Jul. 13, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,594

Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81

Int. Cl.[3] **C07D** *251/42, 251/44, 251/46;* **A01N** *43/66*

U.S. Cl. 71—93 **19 Claims**

1. A compound selected from the group consisting of an N-phenylsulfonyl-N'-triazinylurea of the formula:



wherein

Q is $—CH_2Cl$, $—CCl_3$, $—CHClCH_2Cl$, $—CHBrCH_2Br$, $—CHClCHClCH_3$, $—CHBrCHBrCH_3$, $—CHBrCBr(CH_3)_2$, $—CBr(CH_3)CH_2Br$ or $—CCl(CH_3)CH_2Cl$;

X is —S—, —O—, —SO— OR SO_2—;

Z is —O—, OR —S—;

R_2 is hydrogen, halo, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, haloalkyl of 1 to 4 carbon atoms, nitro, $—YR_5$, —COOR6 or

in which

Y is —O—, —S—, —SO— or $—SO_2$—;

each of R_5 and R_6 is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkynyl of 2 to 6 carbon atoms; and

each of R_7 and R_8 independently of the other is hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or alkynyl of 2 to 6 carbon atoms; and

each of R_3 and R_4 independently of the other is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, halo, or alkoxyalkyl of 2 to 4 carbon atoms; and

the amine, quaternary ammonium, alkali metal and alkaline earth metal salts thereof.

14. A herbicidal and growth regulating composition which comprises an effective amount of at least one compound according to claim 1, together with a suitable carrier therefor.

4,514,213

HERBICIDAL SULFONAMIDES

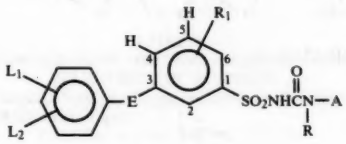
William T. Zimmerman, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 19, 1984, Ser. No. 590,881

Int. Cl.[3] **C07D** *251/18, 251/46;* **A01N** *43/66, 43/70*

U.S. Cl. 71—93 **19 Claims**

1. A compound of the formula



I

wherein

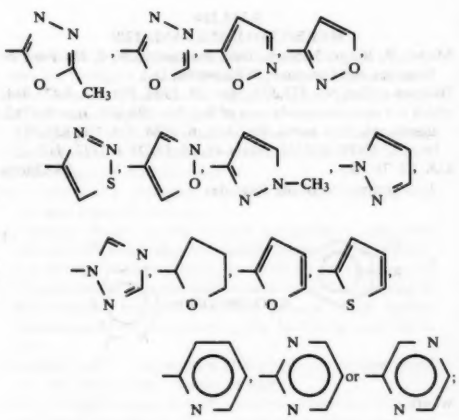
E is O or a single bond;

L_1 is H, F, Cl, Br, NO_2, CH_3, OCH_3 or CF_3;

L_2 is H, F, Cl, Br, CH_3 or OCH_3;

R is H or CH_3;

R_1 is CO_2R_2, $S(O)_nR_3$, $SO_2NR_4R_5$, $SO_2N(OCH_3)CH_3$, OSO_2R_6, WCF_3, $WCHF_2$, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_1–C_2 alkyl substituted with OCH_3 or OC_2H_5, CH_2CH_2Cl, CF_3,



R_2 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_3 is C_1–C_3 alkyl or $CH_2CH{=}CH_2$;

R_4 is H or C_1–C_2 alkyl;

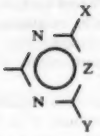
R_5 is C_1–C_2 alkyl;

R_6 is C_1–C_3 alkyl, CF_3 or $N(CH_3)_2$;

W is O or S;

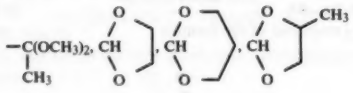
n is 0, 1 or 2;

A is



X is CH_3, OCH_3, OCH_2CH_3, OCF_2H, CH_2F, CH_2Cl, CH_2Br or CF_3;

Y is H, CH_3, OCH_3, OCH_2CH_3, CH_2OCH_3, $CH_2OCH_2CH_3$, NH_2, $NHCH_3$, $N(CH_3)_2$, $N(OCH_3)CH_3$, CH_2CH_3, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, CH_2SCH_3, OCF_2H, OCH_2CH_2F, —CH-$(OCH_3)_2$,



$CH(OCH_2CH_3)_2$ or

Z is N.

8. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid inert diluent.

4,514,214

HERBICIDAL SULFAMATES

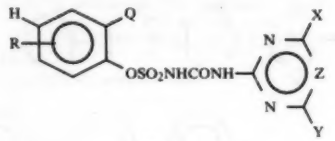
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 473,322, Mar. 15, 1983, Pat. No. 4,475,944, which is a continuation-in-part of Ser. No. 386,680, Jun. 9, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 637,783

Int. Cl.[3] **C07D** *403/12;* **A01N** *43/66;* **C07D** *413/12, 417/12*

U.S. Cl. 71—93 **36 Claims**

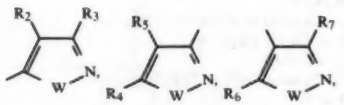
1. A compound of the formula:



I

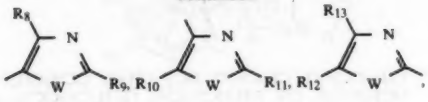
where

Q is

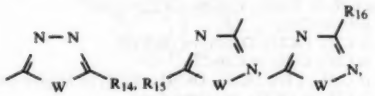


Q-1 Q-2 Q-3

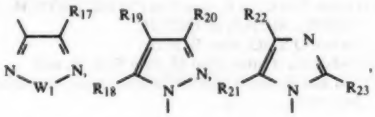
-continued



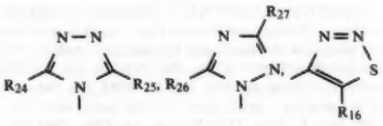
Q-4 Q-5 Q-6



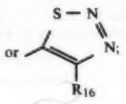
Q-7 Q-8 Q-9



Q-10 Q-11 Q-12



Q-13 Q-14 Q-15



Q-16

R is H, F, Cl, Br, CH_3, CF_3 or OCH_3;

W is O, S or NR_1;

W_1 is O or S;

R_1 is C_1–C_3 alkyl;

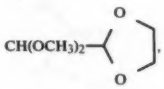
R_2, R_3, R_4, R_5, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{19}, R_{21}, R_{22}, R_{23}, R_{25} or R_{27} are independently H, CH_3 or C_2H_5;

R_6, R_7, R_{17}, R_{24} or R_{26} are independently H or CH_3;

R_{18} or R_{20} are independently H or C_1–C_3 alkyl;

X is Cl, CH_3, OCH_3, OCF_2H or SCF_2H;

Y is CH_3, C_2H_5, OCH_3, OC_2H_5, OCH_2CF_3, CH_2OCH_3,



or GCF_2T where G is O or S and T is H, CHClF, CHBrF, CF_2H or $CHFCF_3$; and Z is N;

provided that when X is Cl, then Y is OCH_3 or OC_2H_5; and their agriculturally suitable salts.

23. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

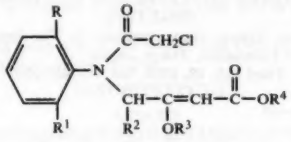
4,514,215

4-(2,6-DIALKYLPHENYLAMINO)-3-ALKOXY-2-BUTENOIC ACID AND THEIR USE AS HERBICIDES

James B. Heather, Hercules, and David B. Kanne, Richmond, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

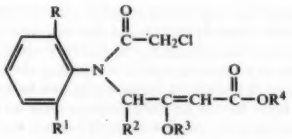
Filed Dec. 12, 1983, Ser. No. 560,621
Int. Cl.[3] A01N *37/10*; C07C *101/453*
U.S. Cl. 71—107 10 Claims

1. A compound having the structural formula



wherein R is Chd 1–C_4 alkyl; R^1 is C_1–C_4 alkyl; R^2 is hydrogen or methyl; R^3 is methyl or ethyl; and R^4 is C_1–C_4 alkyl.

6. The method of controlling grasses comprising applying pre-emergence or pre-plant to the area where control is desired, an herbicidally effective amount of a compound having the formula



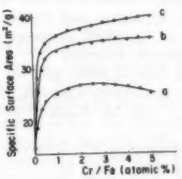
wherein R is C_1–C_4 alkyl; R^1 is C_1–C_4 alkyl; R^2 is hydrogen or methyl; R^3 is methyl or ethyl; and R^4 is C_1–C_4 alkyl.

4,514,216

ACICULAR FERROMAGNETIC ALLOY PARTICLES FOR MAGNETIC RECORDING AND PROCESS FOR PRODUCING THE SAME

Akio Mishima; Yoshiro Okuda; Tosiharu Harada; Akira Mukaizaka, and Tomoyuki Imai, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Jan. 24, 1984, Ser. No. 573,489
Claims priority, application Japan, Apr. 30, 1983, 58-77166; May 31, 1983, 58-98506
Int. Cl.[3] H01F *1/09, 1/33*
U.S. Cl. 75—0.5 AA 6 Claims



1. Acicular ferromagnetic alloy particles for magnetic recording, comprising the acicular ferromagnetic alloy particles containing Si, Cr, Ni and P impregnated with phosphorus compound and silicon compound.

4,514,217

METHOD OF PRODUCING LEAD FROM SULPHIDIC LEAD RAW-MATERIAL

Stig A. Petersson, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed May 10, 1984, Ser. No. 608,948
Claims priority, application Sweden, May 17, 1983, 8302764
Int. Cl.[3] C22B *4/04, 13/00*
U.S. Cl. 75—10 R 7 Claims

1. A method for producing lead from sulphidic lead raw material comprising:

(a) autogenously smelting the sulphidic lead raw material in a shaft in the presence of oxygen gas or air enriched in oxygen thereby forming an oxide-containing molten product;

(b) passing the oxide-containing molten product directly through a heated coke bed arranged in the lower part of the shaft thereby forming a molten lead phase and a slag phase depleted in lead, said coke bed being heated by at least one of partial combustion of carbon therein and electrical energy; and

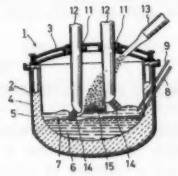
(c) recovering the molten lead phase.

4,514,218

REDUCED IRON MELTING METHOD USING ELECTRIC ARC FURNACE

Etsuo Inagaki, Nagoya, Japan, assignor to Daidotokushuko Kabushikikaisha, Japan

Filed Jun. 6, 1984, Ser. No. 617,778
Int. Cl.[3] C21C *5/52*
U.S. Cl. 75—12 1 Claim



1. A process for melting reduced iron by using an electric arc furnace having a space for melting in its inside and verically movable electrodes in the upper part, the process comprising the following steps (a) to (c):

(a) forming a pool of molten metal at the bottom of the melting space of the furnace while forming a layer of slag overlying said molten metal;

(b) continuously charging reduced iron and melting the charged reduced iron; and

(c) feeding electric power to said electrodes to form arcs between the electrodes and molten metal, said arcs piercing through said slag layer, to make up for the drop of temperature of slag and molten metal caused by melting of said charged reduced iron, said process being further characterized by incorporating the following steps (d) to (h):

(d) detecting the temperature change of said molten metal and the temperature change of slag;

(e) increasing the input power to said electrodes and elongating the arc length by lifting up the electrodes to increase the slag temperature while maintaining the molten metal temperature constant in case the slag temperature has dropped;

(f) decreasing the input power to the electrodes and shortening the arc length by lowering the electrodes to reduce slag temperature alone while maintaining the molten metal temperature unchanged in case the slag temperature has risen;

(g) increasing the input power to the electrodes and shortening the arc length by lowering the electrodes to elevate

the molten metal temperature alone while maintaining the slag temperature unchanged in case the molten metal temperature has dropped; and

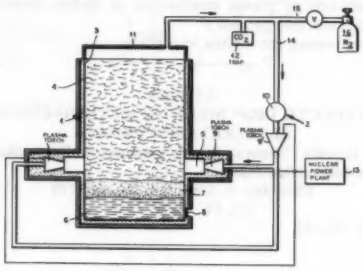
(h) decreasing the input power to the electrodes and elongating the arc length by lifting up the electrodes to reduce molten metal temperature alone while maintaining the slag temperature unchanged in case the molten metal temperature has arisen.

4,514,219

METHOD OF PRODUCING MOLTEN METAL

Lucien de Saint Martin, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Feb. 1, 1984, Ser. No. 575,853
Claims priority, application France, Feb. 3, 1983, 83 01841
Int. Cl.³ C22B *1/248*
U.S. Cl. 75—43 **9 Claims**



1. A method of making a ferrous metal which comprises the steps of:

(a) forming a charge of a ferriferous material selected from the group which consists of iron scrap, pig iron and sponge iron, and a quantity of coke substantially just sufficient for the carburization of the melt;

(b) electrically heating a substantially non-oxidizing gas to a temperature at least equal to the melting point of iron; and

(c) passing said gas after the heating thereof through said charge in a shaft furnace to melt iron of said ferriferous material at a location spaced from that at which said gas is electrically heated and form a bath of molten iron below said charge, the ferriferous material being melted by the sensible heat carried by said gas.

4,514,220

METHOD FOR PRODUCING STEEL IN A TOP-BLOWN VESSEL

Joseph W. Tommaney, Butler County, Pa., and Harry L. Bishop, Jr., Delmar, N.Y., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 26, 1984, Ser. No. 604,098
Int. Cl.³ C21C *5/34, 7/10*
U.S. Cl. 75—60 **17 Claims**

1. A method for producing steel in a top-blown molten metal vessel having a hot metal charge to form a bath, the method comprising:

top blowing a refining gas from a lance onto or beneath the surface of the bath;

said refining gas being substantially oxygen when carbon in the bath is in excess of about 1%, and being a mixture of oxygen and inert gas when carbon in the bath is less than about 1%;

introducing inert gas at a low flow rate to the bath from beneath the surface of the bath during said top blowing;

establishing an overall ratio of oxygen-to-inert gas being injected into the bath of more than 1/1 when top blowing commences;

decreasing the top-blown oxygen while increasing the top-blown inert gas so as to decrease the overall ratio of oxygen-to-inert gas progressively as the carbon is reduced during said top blowing; and

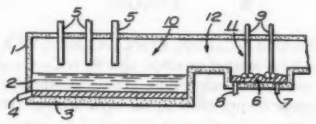
stopping said top blowing when the desired carbon content is reached and with said ratio being less than 1/1.

4,514,221

METHOD OF SMELTING ZINC BY INJECTION SMELTING

Sakichi Goto, Tokyo, Japan, assignor to The Japan Mining Promotive Foundation, Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,669
Int. Cl.³ C22B *19/04*
U.S. Cl. 75—63 **4 Claims**



1. A method of recovering metallic zinc by smelting zinc calcine which contains Fe, SiO_2 and Au, Ag, and Cu as impurities and in which the ratio of Fe/SiO_2 is from about 1 to 3.5, in the presence of a reducing agent, comprising the steps of:

(a) Forming in a smelting furnace a molten bath comprising a slag layer having an Fe/SiO_2 ratio close to that of said zinc calcine and a crude lead layer beneath said slag layer;

(b) Introducing into said furnace said zinc calcine, oxygen-enriched air and a reducing agent selected from the group consisting of pulverized coke and pulverized coal in a manner to contact and mix with said molten bath;

(c) Simultaneously smelting the components of steps a and b so charged to the furnace to produce an effluent gas of zinc vapor, CO, CO_2 and N_2 and to capture in said crude lead layer gold, silver and copper present in small amounts in the zinc calcine;

(d) Passing the effluent gas from the smelting step to a condenser disposed in close proximity to said smelting furnace and providing therein a spray of molten lead or zinc to condense said zinc vapor contained in said effluent gas from said smelting furnace;

(e) separating and recovering from said condensing step metallic zinc and an exhaust gas of high calorie content; and

(f) separating said crude lead layer containing gold, silver, and copper for recovery of same.

4,514,222

HIGH INTENSITY LEAD SMELTING PROCESS

William T. Denholm, Camberwell; John M. Floyd, Glen Waverley; William J. Errington, and Anthony N. Parry, both of Mount Isa, all of Australia, assignors to Mount Isa Mines Limited, Queensland, Australia

Filed Nov. 18, 1982, Ser. No. 442,656
Claims priority, application Australia, Nov. 26, 1981, PF1721
Int. Cl.³ C22B *13/00*
U.S. Cl. 75—77 **9 Claims**

1. A method of smelting a concentrate containing lead sulfide characterized by the steps of:

(1) adding the lead sulfide concentrate to a refractory lined reactor containing iron oxide in a molten, highly-fluid, silicate slag bath maintained in a strongly oxidized and vigorously agitated condition;

(2) mixing all the metal sulfides that are members of the group consisting essentially of lead sulfide, zinc sulfide,

copper sulfide, calcium sulfide, bismuth sulfide, silver sulfide, magnesium sulfide and aluminum sulfide in the silicate slag bath to form a single phase;

(3) maintaining the single phase slag bath in a vigorously agitated, strongly oxidized condition and at a predetermined temperature by injecting hot combustion gases with air in excess of that required to convert all the sulphides to their corresponding oxides through a downwardly extended lance having an outlet submerged in the silicate slag bath;

(4) oxidizing said metal sulfides to their corresponding metal oxides to produce a silicate slag bath rich in lean oxide; and

(5) adding lump coal to the silicate slag bath to reduce the lead oxide to elemental lead.

4,514,223

CONTINUOUS DIRECT PROCESS OF LEAD SMELTING

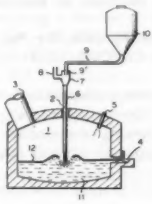
Shizuo Kawakita, Kagawa; Takeyoshi Shibazaki, Tokyo, and Hiromi Mochida, Saitama, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,639

Claims priority, application Japan, May 2, 1983, 58-076286

Int. Cl.³ C22B *13/00*

U.S. Cl. 75—77 **9 Claims**



1. A continuous direct process of lead smelting by top blowing comprising blowing through a lance pipe at a flow rate of at least 100 m/sec a compounded feddstock containing particulate or powdered lead sulfate concentrate and flux and also containing fuel when oxygen-enriched air is used and a stream of oxygen-enriched air or oxygen into a smelting zone containing a molten lead bath so as to penetrate said compounded feedstock through a slag layer and into said molten lead bath which has been preheated to a temperature at which the oxidation reaction of said lead sulfide concentrate is sustained, whereby said oxidation of lead sulfide is avoided in a zone maintained at 1000° to 1300° C. above said bath and said lead sulfide being oxidized in said molten lead bath to form molten crude lead and slag, transferring said molten crude lead and slag to a reduction zone and contacting said slag in said reduction zone with a reducing agent to reduce the lead substances in said slag and to return the reduced lead to the crude lead.

4,514,224

TOUGH CARBIDE BASE CERMET

Kenichi Nishigaki, Urawa, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 208,539, Nov. 20, 1980, abandoned, which is a continuation of Ser. No. 919,289, Jun. 26, 1978, abandoned. This application Nov. 22, 1983, Ser. No. 554,168

Claims priority, application Japan, Aug. 11, 1977, 52-95531

Int. Cl.³ C22C *29/00;* B22F *3/00*

U.S. Cl. 75—238 **3 Claims**

1. A tough carbide base cermet which consists essentially of a chromium carbide free dispersed phase of from 70 to 95% and a binder phase of from 5 to 30% with all percentages being by weight;

(1) said dispersed phase consisting essentially of

(i) titanium nitride in an amount of from 10 to 25%,

(ii) at least one of tungsten, molybdenum and carbides thereof in an amount of from 10 to 30%,

(iii) zirconium carbide in an amount of from 0.2 to 5.0%,

(iv) aluminum nitride of a particle size up to 3 μm in an amount of from 0.1 to 5.0%,

(v) the balance being a composite carbide comprising (a) titanium carbide, and (b) at least one of tantalum carbide and niobium carbide in an amount of from 3 to 50% of said composite carbide; and

(2) said binder phase consisting essentially of

(vi) at least one metal selected from the group consisting of iron, cobalt and nickel and when (a) said at least one metal is only one metal, that metal is nickel and when (b) said at least one metal is more than one metal, at least one of said metals is nickel; and

(vii) also containing aluminum, titanium and incidental impurities; and

said tough carbide base cermet being produced by mixing powders of the materials (i), (ii), (iii), (iv), (v), (vi) and (vii), compressing said powder to form a green compact and then sintering at high temperature under vacuum to form said tough carbide base cermet.

4,514,225

TRIORGANOTIN ACETYLSALICYLATES AND BIOCIDES CONTAINING THE SAME

Horst Landsiedel, Froendenberg, and Hans Plum, Hamm, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

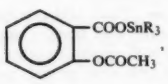
Filed Feb. 21, 1984, Ser. No. 581,652

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306036

Int. Cl.³ C09D *5/14*

U.S. Cl. 106—15.05 **13 Claims**

1. A method for controlling the growth of bacteria, fungi, algae marine organisms on or in a substrate, which method comprises adding or applying to said substrate a compound of the formula



wherein R is cyclohexyl, phenyl, or alkyl having from 3 to 8 carbon atoms.

4,514,226

MONOAZO PYRIDONE COLORANTS

Hermann Leoffler, Speyer, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

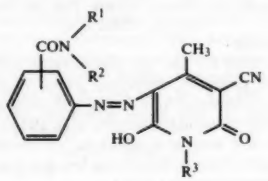
Filed Mar. 10, 1982, Ser. No. 356,729

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111648

Int. Cl.³ C09B *29/42;* C09D *11/02;* C10J *1/24;* C10M *1/40*

U.S. Cl. 106—23 **8 Claims**

1. A colorant of the formula:



wherein R_1 R_2 and R_3 independently of one another are each C_1–C_{18}-alkyl, C_1–C_{18}-alkenyl, C_4–C_9-alkoxyalkyl, C_4–C_9-aryloxyalkyl, C_9–C_{11}-aralkoxyalkyl, C_7–C_{11}-aralkyl, C_4–C_{13}-acyloxyalkyl, C_6–C_{14}-alkoxycarbonyloxyalkyl, C_6–C_{12}-alkylaminocarbonyloxyalkyl or C_4–C_9-dialkylaminoalkyl, with the proviso that the sum of the carbon atoms of the radicals R^1 to R^3 is from 14 to 36 and the sum of the ether oxygen atoms in these radicals ranges from 0 to 2.

8. A method of coloring a coating composition, an organic solvent or a mineral oil product, comprising: dissolving the compound of claim 1 in said coating composition, said organic solvent or said mineral oil product.

4,514,227

METHOD OF MANUFACTURING A FOUNDRY MOULD MIX CONTAINING A MOULD BINDER

Ervin I. Szabó, Manotic, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 419,506, Sep. 19, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,452
Claims priority, application Canada, Dec. 11, 1981, 392120
Int. Cl.³ B28B *7/36*
U.S. Cl. 106—38.2 **6 Claims**

1. A method of manufacturing a foundry mould mix containing a mould binder comprising:

(a) mixing a binder with foundry sand in the range 15 to 150 grams of binder per kilogram of foundry sand, the binder consisting essentially of:

(i) at least one monobasic acid selected from the group consisting of formic acid, acetic acid, propiolic acid, propionic acid, and acrylic acid;

(ii) a precipitant for the acid, the amount of precipitant present in the binder components being equivalent to at least 50% of the stoichiometric requirement of the total acid content of the binder components, said precipitant comprising at least one substance selected from the group consisting of calcium carbonate, dolomite, magnesium oxide, magnesium hydroxide, magnesium carbonate and zinc oxide, said precipitant being substantially non-fluxing with foundry sand, and substantially non-reactive with respect to other mould components than the said total acid content, and substantially non-reactive with respect to metal which is to be cast in the mould, and

(iii) water, the water being present in an amount no greater than 1.5 times the weight of total acid content, calculated on that acid component being in a water free state.

4,514,228

COMPOSITION FOR MAKING IMPERMEABLE WALLS AND OTHER UNDERGROUND STRUCTURES

Daniel Gouvenot, Nanterre, France, assignor to Soletanche, Nanterre, France

Continuation-in-part of Ser. No. 350,298, Feb. 19, 1982, abandoned. This application Jul. 8, 1983, Ser. No. 512,207
Claims priority, application France, Feb. 20, 1981, 81 03410
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—98 **8 Claims**

1. Composition for making impermeable walls and other under-ground structures comprising water, a cement, a silica compound in a dispersed form and an activating agent selected from the group consisting essentially of an alkaline base and an alkaline salt of a weak acid which do not contain silica, the ratio by weight of lime to silica being less than 1 and preferably between approximately 0.3 to 0.5.

4,514,229

PAPER SIZING COMPOSITION

Atsushi Sato, Tokyo; Yoshikazu Murai, Yokohama; Masahito Goto, Kawasaki, and Kanji Mochizuki, Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Apr. 13, 1984, Ser. No. 599,933
Claims priority, application Japan, Apr. 16, 1983, 58-67187
Int. Cl.³ C08K *5/15, 5/48;* **D21D** *3/00*
U.S. Cl. 106—135 **12 Claims**

1. A paper sizing composition which comprises:

20 to 90% by weight of (A) a reaction production and/or its hydrogenation product which reaction product is obtained by reacting maleic anhydride to branched internal mono-olefins having 16 to 28 carbon atoms which are obtained by oligomerizing one or a mixture of straight chain mono-olefin starting materials having 6 to 18 carbon atoms and

10 to 80% by weight of (B) another reaction product and/or its hydrogenation product which reaction product is obtained by reacting maleic anhydride with straight chain internal mono-olefins having 15 to 24 carbon atoms.

4,514,230

ALKYD COMPOSITION FOR HIGH SOLIDS COATINGS

David T. Passmore, Golborne, and Brian P. Windibank, Formby, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,187
Int. Cl.³ C08L *93/00, 91/00*
U.S. Cl. 106—243 **5 Claims**

1. An alkyd composition adapted to be dissolved in a solvent and used as a high solids coating, said alkyd composition being derived from the following components:

(A) about 75 to about 85 mole % terephthalic or phthalic acid,

(B) about 15 to about 25 mole % of adipic, sebacic or azelaic acid,

(C) about 6 to about 12 mole % of trimethylol ethane or trimethylol propane,

(D) about 80 to about 90 mole % neopentyl glycol, and

(E) about 4 to about 8 mole % 2,2,4-trimethyl -pentane-1,3-diol,

said alkyd composition having a molecular weight of about 1000–1500, and a hydroxyl number of about 75–105, and said mole percentages being based on a total of 100 mole % acids and 100 mole % glycols in said composition.

4,514,231

NATURAL OXIDIC OR SILICATE FILLER MODIFIED ON THE SURFACE, A PROCESS FOR ITS PRODUCTION

Dieter Kerner; Peter Kleinschmit, both of Hanau; Alan Parkhouse, Wesseling, and Siegfried Wolff, Bornheim-Merten, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,768
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314742
Int. Cl.³ C09C *3/12;* **C08K** *9/06;* **C08L** *21/00*
U.S. Cl. 106—309 **10 Claims**

1. A process of preparing a surface modified natural oxidic or silicate filler which comprises

(a) emulsifying in a water insoluble organosilicon compound of the formula

$$[R^1{}_n(RO)_{3-n}Si\text{-}(Alk)_m\text{-}(AR)_p]_2[S]_x \quad (I)$$

where

R is an alkyl group having 1 to 4 carbon atoms, or is a C_1–C_4-alkyl-C_1–C_4 alkoxy group or a phenyl group and R^1 is an alkyl group having 1 to 4 carbon atoms or the phenyl group,

n is 0, 1, or 2,

Alk is a divalent straight or branched hydrocarbon group having 1 to 6 carbon atoms,

m is 0 or 1,

Ar is an arylene group having 6 to 12 carbon atoms in the rings,

p is 0 or 1 with the proviso that p and m cannot simultaneously be zero, and x is a number from 2 to 8,

(b) with stirring mixing this emulsion with an aqueous suspension of a finely divided oxidic or silicate filler or a mixture of such fillers at a temperature of 10° to 50° C.,

(c) heating the mixture to a temperature of 50° to 100° C., and

(d) after 10 to 120 minutes, filtering off the modified filler and drying the suspension at a temperature of 100° to 150° C., or spray drying the suspension.

4,514,232

PROCESS FOR STRIPPING SILICON OIL BASE THERMAL GREASE

Joseph G. Ameen, Apalachin, N.Y.; Richard H. Hogrogian, Oakland, N.J., and Samuel L. Smey, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,941

Int. Cl.³ B08B *3/12*

U.S. Cl. 134—1 **2 Claims**

1. A process for stripping a silicone oil base thermal grease from circuit module caps which comprises the steps of:

mixing a solution of 8–12% by volume of a particular composition and 88–92% by volume of methylene chloride, said particular composition comprising 60–80% by volume of ethylene glycol monomethyl ether, the remainder of said composition comprising wetting agents, color, an oxygenated solvent, and a strong base;

placing said caps having said thermal grease in a container of said solution;

ultrasonically agitating said container of solution for one minute;

removing said caps from the container and subjecting them to water rinsing and air blow drying leaving a water-break-free surface;

immersing the cleaned caps in a first solution of 10% by volume of said particular composition and 90% by volume of methylene chloride and ultrasonically agitating the solution for one minute; and

immersing said cleaned caps in a second solution of 10–30% by volume of nitric acid and ultrasonically agitating the solution for one minute.

4,514,233

METHOD OF MAKING IMPROVED ALUMINUM METALLIZATION IN SELF-ALIGNED POLYSILICON GATE TECHNOLOGY

Katsuhiro Kawabuchi, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 17, 1983, Ser. No. 523,835

Claims priority, application Japan, Aug. 25, 1982, 57-147055

Int. Cl.³ B01J *17/00*; H01L *21/26*

U.S. Cl. 148—1.5 **11 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:

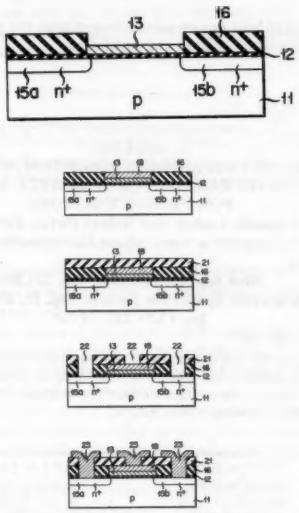
(a) sequentially forming a gate insulation film, a polycrystalline silicon film and a self-alignment film on a semiconductor substrate of one conductivity type;

(b) selectively removing said polycrystalline silicon film and said self-alignment film to form a laminate structure having a pattern corresponding to a desired gate electrode pattern and comprising the remaining polycrystalline silicon film and the remaining self-alignment film formed thereon;

(c) ion-implanting an impurity of an opposite conductivity type into said substrate using said laminate structure as a mask, thereby forming at least one impurity region;

(d) forming an insulation layer on an entire surface of the structure obtained in step C including said laminate structure;

(e) etching said insulation layer in a direction of thickness thereof until the surface of said laminate structure, thereby allowing said insulation layer to remain only around said laminate structure, said remaining insulation layer having a surface flush with that of said laminate structure is exposed;



(f) removing said remaining self-alignment of film from said laminate structure so as to expose said remaining polycrystalline silicon film of said laminate structure;

(g) forming an aluminum film only on said exposed remaining polycrystalline silicon film, thereby providing a gate electrode structure comprising said remaining polycrystalline film and said aluminum film, said aluminum film having a surface flush with that of said remaining insulation layer; and

(h) performing annealing to activate said impurity ion-implanted into said substrate, before said aluminum film is formed.

4,514,234

MOLYBDENUM BOARD AND PROCESS OF MANUFACTURING THE SAME

Yoshiharu Fukasawa; Tatsuhiko Matsumoto; Mituo Kawai; Shigeru Ueda, all of Yokohama; Hideo Koizumi, Tokyo, and Hiroyuki Saitou, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 9, 1984, Ser. No. 578,580

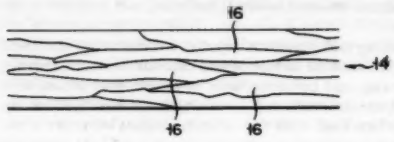
Claims priority, application Japan, Feb. 10, 1983, 58-19779; Feb. 10, 1983, 58-19780

Int. Cl.³ B22F *3/16*

U.S. Cl. 148—11.5 P **10 Claims**

1. A molybdenum board consisting essentially of molybde-

num recrystallized grains having a ratio L/W of not less than 2 and a W of 5 to 1,000 μm and containing 0.005 to 0.75% by



weight of at least one element selected from the group consisting of aluminum, silicon and potassium.

4,514,235

FROG, IN PARTICULAR FROG POINT, FOR RAIL CROSSING OR RAIL SWITCHES AS WELL AS PROCESS FOR PRODUCING SAME

Hubert Augustin, Leoben, and Robert Pirker, Zeltweg, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Sep. 12, 1983, Ser. No. 531,399
Claims priority, application Austria, Sep. 15, 1982, 3457/82
Int. Cl.³ C22C *38/08*
U.S. Cl. 148—37 **3 Claims**

1. A frog for rail crossings or rail switches wherein said frog having a surface, for wheels to travel upon, characterized in that the frog or the surface of the frog is made of an age-hardened steel consisting essentially of

C 0.01 to 0.05%	Ti 0.1 to 1%
Si 0.01 to 0.2%	Cr 0 to 13%
Mn 0.01 to 0.2%	Al 0 to 0.2%
Co 0 to 15%	B 0 to 0.1%
Mo 1.5 to 6%	Zr 0 to 0.1%
Ni 7 to 20%	

and the balance of iron.

4,514,236

METHOD OF MANUFACTURING AN ARTICLE OF NON-MAGNETIC AUSTENITIC ALLOY STEEL FOR A DRILL COLLAR

William T. Cook, Sheffield; Michael Cristinacce, Rotherham, and Rajendra K. Amin, Sheffield, all of England, assignors to British Steel Corporation, England

Filed Mar. 1, 1983, Ser. No. 470,975
Claims priority, application United Kingdom, Mar. 2, 1982, 8206104
Int. Cl.³ C22C *38/40*
U.S. Cl. 148—38 **8 Claims**

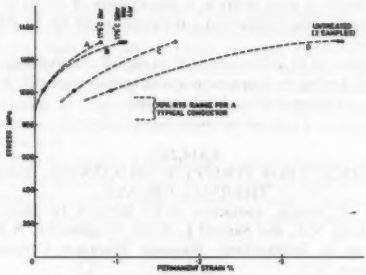
1. A non-magnetic drill collar manufactured by a method comprising the steps of producing a feedstock having a composition consisting essentially of, by weight, up to 0.50% carbon, from 12 to 20% manganese, up to 1% silicon, up to 0.10% phosphorus, up to 0.10% sulphur, up to 20% chromium, up to 1% molybdenum, up to 1% nickel, from 0.20 to 0.60% nitrogen, from 0.20 to 1% vanadium, up to 0.1% niobium, balance iron apart from impurities and incidental ingredients, heating the feedstock to a temperature of between 1100° C. and 1250° C., rolling the heated feedstock to the cross-section required for the article in a controlled manner to achieve a finish temperature below 1100° C. and quenching the rolled feedstock, the article produced being characterized by a proof stress at 0.2% in excess of 700 N/mm^2 in the as-rolled condition.

4,514,237

METHOD OF HEAT TREATING STEEL WIRE

Olaf Nigol, 272 Markland Dr., Toronto, Ontario, Canada M9C IR7, and John S. Barrett, R.R. #8, Orangeville, Ontario, Canada (L9W 3T5)

Filed Jan. 17, 1983, Ser. No. 458,319
Int. Cl.³ C21D *9/52*
U.S. Cl. 148—142 **10 Claims**



1. A method of treating hard-drawn carbon steel core wire having breaking strain values greater than 3.0% and having a carbon content in the range 0.50–0.85% and used in aluminum conductor, steel reinforced power transmission lines, whereby to reduce the ductility of the wire and its susceptibility to permanent elongation under tensile strain, which method comprises heating the wire to a temperature in the range 150° C.–200° C. while maintaining the wire in an untensioned state at said temperature for at least one hour, the wire thereafter being cooled to ambient temperature, wherein permanent strain in the wire after said treatment is in the range of 0.01% to 0.02% after 70% RTS loading of the wire.

4,514,238

INTERNALLY OXIDIZED AG-SN-BI ALLOY ELECTRICAL CONTACT MATERIALS

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Continuation-in-part of Ser. No. 586,877, Mar. 8, 1984, abandoned, which is a continuation of Ser. No. 347,500, Feb. 10, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 666,032
Claims priority, application Japan, Feb. 12, 1981, 56-18096; May 2, 1981, 56-66185
Int. Cl.³ C22C *5/06*
U.S. Cl. 148—431 **1 Claim**

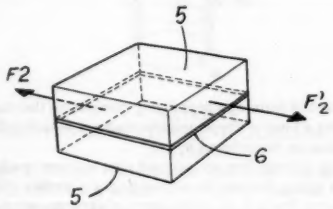
1. An electrical contact material comprising an alloy of silver and solute metal elements, said alloy having a matrix consisting of silver, said solute metal elements comprising more than 6 weight percent to 20 weight percent of Sn, and an additive for accelerating the internal oxidation of said alloy consisting essentially of more than 2 weight percent to 5.5 weight percent of Bi, and said alloy being completely internally oxidized so that said solute metal elements are present in said alloy totaly as oxides which are very finely precipitated throughout said silver matrix, said matrix presenting substantially no silver grain crystalline boundaries.

4,514,239
Patent Not Issued For This Number

4,514,240
METHOD FOR ADHESIVELY BONDING PARTS MADE OF REFRACTORY MATERIALS

Louis Heraud, Bordeaux, France, assignor to Societe Europeenne De Propulsion, Puteau, France

Continuation of Ser. No. 313,961, Oct. 20, 1981, abandoned. This application Jan. 11, 1984, Ser. No. 569,929
Claims priority, application France, Oct. 30, 1980, 80 23215
Int. Cl.³ C03B *29/00;* **C04B** *33/34, 37/00*
U.S. Cl. 156—89 **9 Claims**



1. Method for bonding together into an integral assembly preformed members each comprised of a composite refractory material which is porous or become porous upon pyrolysis, said method comprising the following steps:

assembling said members with a bonding layer between mutually adjacent faces thereof, said bonding layer consisting essentially of an adhesive which upon pyrolysis leaves a porous refractory residue, and a filler constituted by refractory particles of dimensions comprised between 1 and 150 microns, said layer having a substantially constant thickness which has a value selected in the range of 0.1 to 1 mm;

subjecting the thus-formed assembly to pyrolysis to create between the members thereof a porous refractory bond containing said filler between the mutually adjacent faces of said members, and

densifying the pyrolyzed assembly by chemical vapor deposition into the pores thereof of a refractory material, whereby said densifying refractory material is deposited simultaneously and continuously in the pores of said bond and of the adjacent member to produce an integral densified assembly.

4,514,241
REINSULATION OF PIPE JOINTS

Pekka J. Maukola, Kessel-lo, Belgium, assignor to N. V. Raychem S.A., Kessel-lo, Belgium

Filed Mar. 9, 1984, Ser. No. 586,912
Claims priority, application United Kingdom, Mar. 11, 1983, 8306693
Int. Cl.³ B32B *31/26*
U.S. Cl. 156—79 **19 Claims**

1. A method of insulating a joint between thermally insulated pipes, the insulation of which ends short of the joint leaving a portion of the pipe bare of insulation, which method comprises:

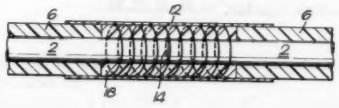
(a) positioning around the bare portion of pipe a support at least part of which is provided by a coiled member;

(b) positioning a recoverable cover such that a first segment thereof is positioned around the support such that when the support is positioned around the pipe, at least one other segment of the cover is positioned so as to engage the insulation of the pipe upon recovery of the cover;

(c) recovering the first segment of the cover into engagement with the support;

(d) recovering at least one other segment of the cover into engagement with the insulation of the pipe; and

(e) providing a thermally insulating material between the recovered cover and the bare portion of pipe.



15. A kit of parts for insulating a joint between an insulated main pipe and a branch-off pipe, the insulation of which ends short of the joint, which comprises:

(a) a support which comprises a coiled member that can be positioned around a bare portion of the branch-off pipe, and a further part that can be wrapped around the bared portion of the main pipe; and

(b) a recoverable cover having a first tubular portion for covering the installed coiled member and a second wrap-around portion for covering the further part of the support;

wherein the support is coated on an outer surface thereof with an adhesive or sealant such that it is capable of adhering to said cover.

4,514,242
METHODS FOR OSCILLATORY BONDING OF DISSIMILAR THERMOPLASTIC MATERIALS

Donald N. MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Vercon Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 371,363, Apr. 23, 1982, Pat. No. 4,462,849. This application Aug. 27, 1984, Ser. No. 644,190
Int. Cl.³ B29C *27/08*
U.S. Cl. 156—73.5 **11 Claims**

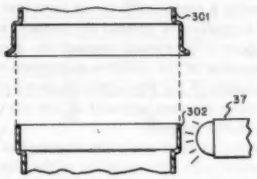
1. A method of welding at least two similarly configured thermoplastic sections together having relatively tight-fitting complementary joinder portions, said method comprising:

preheating at least one of said sections in its joinder portion;

sliding said tight-fitting portions together into telescopic conjoinment;

oscillating said portions axially with respect to each other at a sufficiently rapid rate and for a sufficient period of time

to generate enough heat to melt the areas of contact therebetween; and,



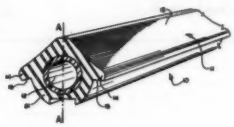
bringing said sections into a final desirable position and allowing said heated areas to cool, thereby welding said sections together.

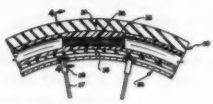
4,514,243

TIRE FOR WHEELCHAIRS AND THE LIKE

Dan T. Moore, III, and Michael F. Fischer, both of Cleveland Heights, Ohio, assignors to Dan T. Moore Co., Cleveland, Ohio

Filed Jul. 9, 1982, Ser. No. 396,694
Int. Cl.³ B29H *11/00*; B60C *7/12*
U.S. Cl. 156—113 **2 Claims**





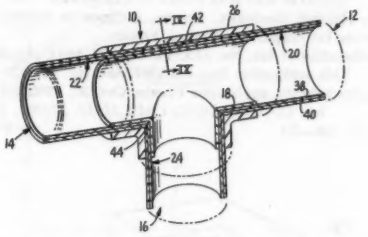
1. A method of making a tire for a wheelchair or the like, comprising the steps of extruding an elastomeric casing of relatively low modulus of elasticity over a semirigid, thermoplastic, creep-resistant hollow core of relatively high modulus of elasticity, cutting the extruded casing and core to the circumferential length of the tire, positioning a ferromagnetic insert in opposite ends of the core, said insert being coated with a thermoplastic elastomer which is fuse-compatible with the elastomer of the core, abutting the ends of the casing and core, exposing the zone of the ferromagnetic insert to high frequency electromagnetic radiation to inductively heat the surfaces of the insert and generate sufficient heat to thermally fuse the material in the vicinity of the insert to the inside surfaces of the core to effectuate a permanent coupling of the ends of the tire whereby the core provides the major resistance to hoop stress in the tire.

4,514,244

PLASTIC PIPE ELEMENTS AND METHODS FOR MAKING SAME

Robert R. Shaefer, and Kenneth J. Matthews, both of Louisville, Ky., assignors to Nibco Inc., Elkart, Ind.

Division of Ser. No. 303,757, Sep. 21, 1981, Pat. No. 4,457,542.
This application Mar. 12, 1984, Ser. No. 588,703
Int. Cl.³ B29C *27/14*; F16L *47/02*
U.S. Cl. 156—158 **21 Claims**



1. A method of forming a pipe fitting comprising the steps of:

A. forming a liner of thermoplastic material which defines a fluid passage therethrough;

B. forming at least first and second pipe sections, each pipe section being formed by embedding a plurality of reinforcement fibers in an outer layer of thermosetting resin such that said fibers are encompassed within said resin layer and bounding said outer layer to an inner lining of thermoplastic material;

C. bounding said first pipe section onto an outer surface of a first section of said liner such that an end edge of said first pipe section overlies said liner;

D. bonding said second pipe section onto an outer surface of a second section of said liner such that an end edge of said second pipe section overlies said liner;

E. forming an external reinforcement sheet by embedding a layer of reinforcement fibers in a layer of thermosetting, resin such that said fiber layer is encompassed within said resin sheet; and

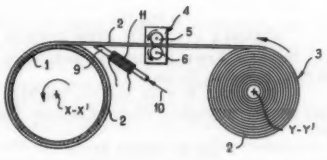
F. bonding said external reinforcement sheet to the exterior surfaces of said pipe sections, covering said end edges.

4,514,245

METHOD FOR REINFORCING A HOLLOW BODY MADE BY WINDING A PROFILED SECTION

Gilbert Chabrier, Montmorency, France, assignor to Spie-Batignolles, Puteaux and Coflexip, Paris, both of, France

PCT No. PCT/FR81/00119, § 371 Date May 4, 1982, § 102(e) Date May 4, 1982, PCT Pub. No. WO82/01159, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 16, 1981, Ser. No. 380,868
Claims priority, application France, Sep. 26, 1980, 80 20666
Int. Cl.³ B65H *81/08*
U.S. Cl. 156—161 **5 Claims**



1. A method of reinforcing a cylindrical hollow body (1) intended to contain a fluid under pressure, comprising winding

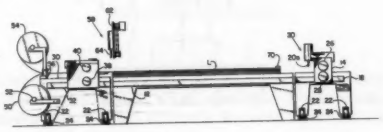
on the hollow body a series of substantially contiguous turns (*2a, 2b, 2c*) of a flexible strip (**2**) so as to form on said body at least one layer of said strip, said strip being comprised of fibers (*7*) embedded in an unfused completely polymerized synthetic resin and extending lengthwise of the strip, applying to the strip during winding a tension, said tension and the thickness of the layer of said strip on said body being such that when the hollow body contains a fluid under pressure the stresses which occur in the body and in the turns of the strip reach their maximum limits at substantially the same time, said tension being obtained solely by said winding and the unfused condition of the resin precluding migration of the fibers radially inwardly through the resin, and fixing continuously said strip on the hollow body and the different turns together.

4,514,246

METHOD OF CUTTING AND LABELING SHEET MATERIAL

Robert E. Forrer, Los Alamitos, Calif., and Robert A. Postier, Flagstaff, Ariz., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Nov. 3, 1982, Ser. No. 438,926
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—264 **6 Claims**



1. A method for spreading sheet material on a support surface of a cutting table between opposite first and second ends of said cutting table and applying labels to said sheet material in preparation for cutting a plurality of pattern pieces from said sheet material with each piece bearing an identifying label comprising at least the following steps:

providing at the first end of the cutting table a spreading and labeling carriage that is movable over the support surface of said cutting table under automatic control;

clamping a ply of sheet material adjacent a free end thereof to the spreading and labeling carriage while said carriage is located adjacent the first end of the cutting table and the sheet material is located off of said cutting table;

moving the spreading and labeling carriage over the support surface from said first end of said cutting table toward said second end and drawing the clamped sheet material onto the support surface to spread the sheet material on said cutting table;

releasing the clamped free end of the sheet material from the spreading and labeling carriage after said sheet material has been so spread;

controllably returning the spreading and labeling carriage back to the first end of the table after releasing the material spread on the support surface; and

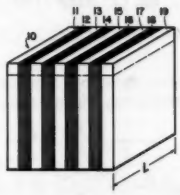
applying labels from the spreading and labeling carriage to the areas of the spread sheet material from which pattern pieces are to be cut during the return movement of the spreading and labeling carriage to the first end of the table.

4,514,247

METHOD FOR FABRICATING COMPOSITE TRANSDUCERS

John Zola, Ramsey, N.J., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,309
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—250 **12 Claims**



1. A method for manufacturing composite transducers comprising the steps of:

bonding together a plurality of plates of an electrically active material with plates of a passive material to form a laminated block having alternating regions of said electrically active material and said passive material;

cutting the laminated block along planes which form an angle with the interfaces of the plates to obtain a plurality of laminated plates; and

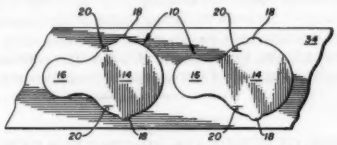
bonding said laminated plates together with a plurality of plates of additional passive material to form a laminated block which comprises strips of said electrically active material which are wholly surrounded by regions of said passive material.

4,514,248

METHOD OF MAKING A FLEXIBLE STERILE CLOSURE SYSTEM FOR CONTAINERS

Robert Cummings, Richardson, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.

Division of Ser. No. 386,021, Jun. 7, 1982, Pat. No. 4,423,819, which is a continuation-in-part of Ser. No. 294,331, Aug. 19, 1981, Pat. No. 4,390,104. This application Oct. 11, 1983, Ser. No. 540,638
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—268 **13 Claims**



1. The method of assembling a thin film closure for resealing a container, comprising:

bonding a first layer of plastic film to a second layer of plastically deformable film with a layer of adhesive, at least one of said first or second layers being substantially impervious to moisture and bacteria;

forming a cover region and pull-tab region from said bonded first and second layers;

applying a layer of adhesive material to the exposed major surface of said second layer to form an adhesive-coated bottom surface of the cover;

slitting the cover region adjacent said pull-tab region to form a tear line for promoting the tearing of the cover upon its removal from the container;

attaching the adhesive-coated bottom surface of the cover to a carrier liner;

packaging the attached sealing cover and carrier liner; and

sterilizing the packaged sealing cover and carrier liner.

4,514,249

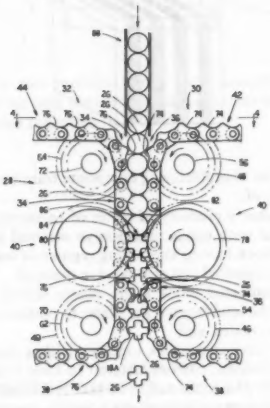
DEVICE FOR MAKING GROOVES IN CIGARETTE FILTERS

Steven P. Reed, Felton, Calif., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 19, 1984, Ser. No. 632,509

Int. Cl.³ B28B *11/08*

U.S. Cl. 156—553 **16 Claims**



1. An apparatus for forming grooves in a cigarette filter rod comprising:

first endless conveyor means;

second endless conveyor means located next to the first endless conveyor means with one flight of the second endless conveyor means in facing, spaced apart, generally parallel relationship to one flight of the first endless conveyor means;

means associated with the first and second endless conveyor means for holding the filter rods at predetermined spaced apart intervals along the space between the facing flights of the first and second endless conveyor means; and,

grooving means located between the ends of the endless conveyor means for forming grooves in the filter rods in the space between the facing flights of the first and second endless conveyor means as the filter rods move with the facing flights from one end of the endless conveyor means to the other end of the endless conveyor means.

4,514,250

METHOD OF SUBSTRATE HEATING FOR DEPOSITION PROCESSES

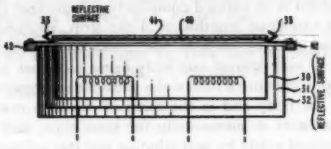
James C. Hwang, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 18, 1982, Ser. No. 434,925

Int. Cl.³ B05D *3/06;* **H01L** *21/20;* **C23C** *13/00*

U.S. Cl. 156—610 **13 Claims**

1. A process for vacuum depositing a material on a heated substrate comprising the steps of heating said substrate to a temperature that induces deposition of said material from a deposition medium and forming said material on said heated substrate by contacting said substrate with said medium characterized in that said deposition is performed at reduced pressures, and said heating comprises (1) providing said substrate with a surface, other than that upon which said deposition is to occur, that is at least 80 percent reflective, (2) providing a reflective environment for said reflective surface, and (3) providing radiant energy which is in part absorbed during any single impact with said reflective surface wherein the combination of said reflective surface and said reflective surrounding



causes multiple reflection of the predominant portion of said radiant energy.

4,514,251

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE, IN WHICH PATTERNS ARE FORMED IN A LAYER OF SILICON NITRIDE BY MEANS OF ION IMPLANTATION

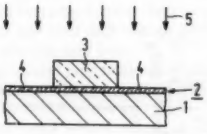
Alfred H. van Ommen; Henricus G. R. Maas; Johannes A. Appels, and Wilhelmus J. M. J. Josquin, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,092

Claims priority, application Netherlands, Apr. 11, 1983, 8301262

Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—628 **17 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of

implanting ions into portions of a layer of silicon nitride,

then heat treating said layer of silicon nitride at a temperature above 750° C. to form a higher resistance to etching at the implanted portions of said layer than at non-implanted portions of said layer, and

thereafter etching said layer to remove said non-implanted portions of said layer.

4,514,252

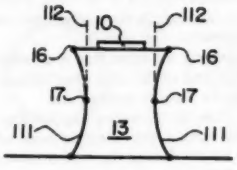
TECHNIQUE OF PRODUCING TAPERED FEATURES IN INTEGRATED CIRCUITS

James P. Roland, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 18, 1982, Ser. No. 442,545

Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **5 Claims**



1. A process of generating tapered walls in a process of the

type in which a mask having a plurality of features is generated on a workpiece to be etched and the workpiece is exposed to etchants through the open areas of the mask to replicate the features of the mask into a workpiece, thereby producing, at the boundaries of each feature, walls which have upper corners at the interface between the mask and the workpiece, said process, in order to cut back the upper corners to taper the walls generated in the workpiece, further comprising the steps of:

(a) after replicating the mask features into the workpiece, isotropically etching the boundaries of the mask features away from the associated walls produced in the workpiece to expose the upper corners, the distance which the boundaries of the mask are etched away from the associated walls not being determined by an additional mask; and

(b) exposing the workpiece to etchants to etch away the upper corners to a lesser depth than the depth of the walls of the mask pattern replicated into the workpiece.

4,514,253

MANUFACTURE OF THIN FILM TRANSISTOR

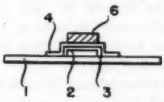
Shigehiro Minezaki, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 288,330, Jul. 30, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 517,042

Claims priority, application Japan, Jul. 31, 1980, 55-106887

Int. Cl.³ H01L *21/312;* **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00*

U.S. Cl. 156—659.1 **14 Claims**



1. A method of making a thin film transistor device comprising an insulator substrate, a gate electrode, a semiconductor layer and a source/drain electrode disposed on said insulator substrate, which comprises:

providing a insulator substrate with a gate electrode formed thereon said gate electrode having a gate insulating oxide coating;

forming selectively a semiconductor layer thereon;

superimposing a mask over selected portions of said gate insulating coating and said semiconductor layer and depositing a source/drain electrode material thereon;

removing said mask and depositing a uniform coating of a photo-resist material on said source/drain electrode material which remains on said substrate;

selectively exposing said photo-resist material to light and developing said exposed material to form a resist pattern;

etching said resulting patterned configuration to form a desired source/drain electrode pattern thereon to provide said thin film transistor.

4,514,254

GROUNDPLANE POST-ETCH ANODIZATION

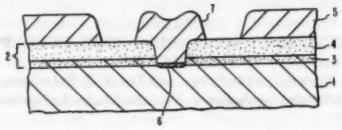
Stephen P. Klepner, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1983, Ser. No. 536,141

Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—656 **2 Claims**

1. A process for producing low temperature integrated circuit intermediate process wafers, having steps including the production of one or more large metal groundplane areas, covering the groundplane with a composite insulating/spacing etch-stop layer of grown oxide and an overlying deposited oxide, subsequently carrying out deposition and patterning steps for one or more layers of metallization, one or more of such steps being sufficiently corrosive as to present a finite probability of opening pinholes in the composite insulating/-spacing etch-stop layer characterized by a step of post-etch anodizing the integrated circuit wafer to grow sealant layers of



groundplane metal oxide at sites of groundplane metal exposing pinholes, to seal such pinholes permanently prior to further processing steps.

4,514,255

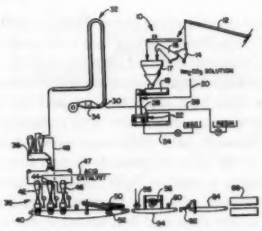
PROCESS FOR THE MANUFACTURE OF DRIED, RESIN-TREATED FIBER FURNISH

John W. Maxwell, West Redding, Conn., and Brian Vyse, East Wellow Romsey, England, assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 19, 1983, Ser. No. 524,883

Int. Cl.³ D21C *9/00*

U.S. Cl. 162—9 **19 Claims**



1. A process for forming a dried, resin-treated fiber furnish from a naturally-acidic fiber comprising:

adding to said fibers not more than about 1% of the dry weight of said fibers of an alkaline material thereby neutralizing at least part of the acid in said fibers, and raising the pH of said fibers into the range of about 4 to about 7;

blow-line blending said fibers with a urea-formaldehyde resin; and

drying said resin-blended fibers to produce a dried, resin-treated fiber furnish, said drying being effected at a temperature sufficiently low that curing of said resin does not occur during said drying.

4,514,256

METHOD OF MINIMIZING SLAGGING IN THE BURNING OF BLACK LIQUID

Alfred E. Kober, 81 Claire Dr., Bridgewater, N.J. 08807, and Stanley E. Gilewicz, 44 Center Grove Rd., Randolph, N.J. 07869

Filed Apr. 18, 1983, Ser. No. 485,750

Int. Cl.³ D21C *11/12;* **C10L** *10/00;* **F23J** *1/00*

U.S. Cl. 162—30.11 **30 Claims**

1. The method of minimizing the problem of slag formation in a black liquor furnace which comprises applying to the furnace surfaces above the combustion zone where slag tends to form, substantially progressively as black liquor is burned in the furnace, a substance from the group consisting of sodium persulfate, manganese dioxide, cupric oxide, ferric oxide and mixtures thereof, said substance being introduced essentially solely into the system upstream of said surfaces at a location which permits it to reach said surfaces in essentially unreduced

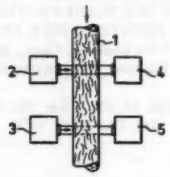
form, said substance then reacting at said surfaces with combustion products of the furnace to oxidize said products and be itself reduced.

4,514,257

METHOD OF MEASURING FINES IN PULP SUSPENSIONS

Hakan I. Karlsson, Akersberga, and Jan G. T. Pettersson, Täby, both of Sweden, assignors to Svenska Traforskningsinstitutet, Sweden

Filed Mar. 12, 1982, Ser. No. 357,476
Claims priority, application Sweden, Mar. 19, 1981, 8101741
Int. Cl.³ G01N *15/00, 21/00, 21/31*
U.S. Cl. 162—49 **10 Claims**



1. A method of measuring the content of crill particles in a suspension of pulp fibers wherein said crill particles have a first mean particle diameter and said pulp fibers have a second mean particle diameter, said first mean particle diameter being substantially less than said second mean particle diameter, said method comprising passing a first light radiation having a first wavelength through said pulp suspension, said first wavelength being of the same magnitude as said first mean particle diameter, passing a second light radiation having a second wavelength through said pulp suspension, said second wavelength being longer than said first wavelength but shorter than said second mean particle diameter, collecting said first and second light radiations after they have passed through said pulp suspension, measuring first and second absorbencies for said first and second collected light radiations, respectively, and determining the content of said crill in said pulp suspension from said first and second absorbencies.

4,514,258

REINFORCED WOOD PARTICLE BOARD AND A METHOD OF PRODUCING IT

Lars Hammarberg, Avant. Poste 3, CH-1005 Lausanne, Switzerland

PCT No. PCT/SE81/00358, § 371 Date Jul. 30, 1982, § 102(e) Date Jul. 30, 1982, PCT Pub. No. WO82/01849, PCT Pub. Date Jun. 10, 1982
PCT Filed Dec. 7, 1981, Ser. No. 403,668
Claims priority, application Sweden, Dec. 5, 1980, 8008552
Int. Cl.³ D21H *3/82*
U.S. Cl. 162—107 **18 Claims**

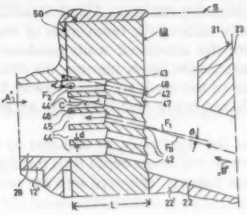
1. A method of producing a wet laid continuous glass fiber thread reinforced wood particle board comprising, coating the glass fiber threads with an adhesive, dewatering an aqueous wood particle stock to form a first wet layer of wood particles, continuously applying said coated glass fiber threads onto said first wet layer of wood particles at a side to side spacing of between about 10 mm to about 100 mm, applying a second wet layer of wood particle stock on said coated glass fiber threads and first wood particle layer whereby said coated glass fiber threads are embedded and fixed between said first and second wood particle layer pressing to form said board.

4,514,259

HEADBOX FOR A PAPER MACHINE

Erkki Koski, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Sep. 30, 1982, Ser. No. 432,370
Claims priority, application Finland, Oct. 12, 1981, 81958
Int. Cl.³ D21F *1/06*
U.S. Cl. 162—343 **24 Claims**



1. In a headbox for a paper machine including a distributor beam part communicating with a distribution part, and a turbulence part followed by a slice part, said turbulance part comprising a turbulence generator member provided with a plurality of flow bores, each flow bore having an inlet mouth and an outlet mouth, the improvement comprising:

said plurality of flow bores being elongated and disposed in a plurality of substantially transverse rows, said flow bores each having a substantially circular cross-section;

a plurality of elongated flow slots of substantially rectangular cross-section formed in said turbulence generator member with the outlet mouths of a respective, substantially transverse row of said flow bores opening into a respective flow slot; and

wherein a central plane of each flow slot forms an angle with the axes of said flow bores in the respective row, the magnitude of said angle being in the range of about 5° to 45° and angles of all said plurality of slots with said respective rows extending in the same direction with respect to one another.

4,514,260

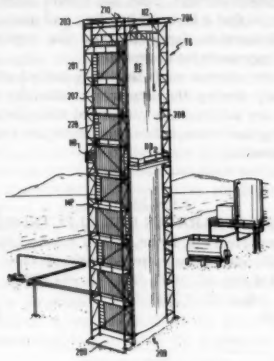
APPARATUS FOR THE DESALINATION OF SEA WATER

Gamal el Din Nasser, Puchheim, Fed. Rep. of Germany, assignor to D.V.T. Büro für Anwendung Deutscher Verfahrenstechnik H. Morsy, Dusseldorf, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,708
Claims priority, application Fed. Rep. of Germany, May 24, 1982, 3219456
Int. Cl.³ B01D *3/00*
U.S. Cl. 202—270 **10 Claims**

1. Apparatus for the pressure-tight enclosure of a column, such as a heat exchanger column for desalinating sea water in a multi-effect evaporation process, comprising elements designed, sized and arranged for facilitating manufacture, transport, assembly and maintenance of a tall, narrow pressure-tight heat exchange column including an upwardly extending support structure, an upwardly extending tall narrow container positioned within said support structure and including four upwardly extending elongated side walls arranged in two pairs with said side walls of each said pair facing one another and disposed in spaced relation, and two spaced facing end walls extending across the opposite ends of said side walls and forming the top and bottom of said container, said end walls and one pair of said side walls are fixed to said support structure and the other pair of said side walls are movably secured to the support structure, a lifting tackle is located on said support structure above said top end wall of said container, a movable working platform located across each movable side wall of said container form movement in the upward direction, and means for securing said movable side walls in pressure-tight condition

relative to said side walls and end walls fixed to said support structure and said means being releasable for moving said



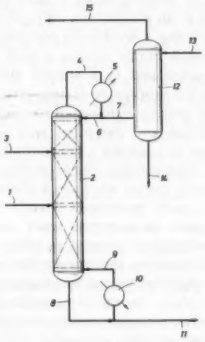
movable side walls into the open position for affording access to the interior of the said container.

4,514,261

REFINING OF TERTIARY BUTYLSTYRENE

Glen F. Crum, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Aug. 31, 1984, Ser. No. 646,267
Int. Cl.³ B01D *3/40*; C07C *7/08*
U.S. Cl. 203—9 **10 Claims**



1. A process for the refining of a t-butylstyrene stream containing isopropenylstyrene comprising:

introducing said stream as feed to an extractive distillation zone; subjecting said feed to extractive distillation with sulfolane as solvent; removing overhead refined t-butylstyrene depleted in isopropenylstyrene and removing sulfolane-containing isopropenylstyrene as bottoms.

4,514,262

SEPARATION OF BENZENE FROM NON-AROMATIC HYDROCARBONS BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Aug. 2, 1982, Ser. No. 404,448
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.
Int. Cl.³ B01D *3/40*; C07C *7/08*
U.S. Cl. 203—51 **5 Claims**

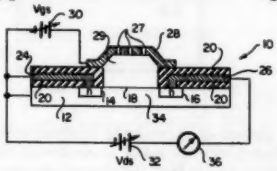
1. A method for separating benzene from close boiling non-aromatic hydrocarbons which comprises distilling a mixture of benzene and close boiling non-aromatic hydrocarbons in a rectification column in the presence of a sufficient amount of an extractive agent to provide a relative volatility of 2.0 or greater comprising effective proportions of at least phthalic anhydride and at least one solvent from the group consisting of acetophenone, adiponitrile, anisole, benzophenone, benzyl acetate, butoxypropanol, butyl benzyl phthalate, diethyl maleate, diethyl oxalate, diethylene glycol, N,N-dimethyl acetamide, N(N,N-dimethylaminopropyl)-2-pyrrolidine, dimethylformamide, dimethylsulfone, dimethylsulfoxide, dipropylene glycol, ethyl acetoacetate, ethylene glycol diacetate, ethylene glycol phenyl ether, formamide, furfural, glycerol triacetate, isobornyl acetate, isophorone, N-isopropyl-2-pyrrolidone, 1-methyl-2-pyrrolidinone, nitrobenzene, 2-nitrotoluene, 3-nitrotoluene, n-octanol, 2,4-pentanedione, phenol, phenyl acetate, phenyl acetic acid, sulfolane, sulfolene, tetrahydrofurfuryl alcohol, and triethylene glycol diacetate.

4,514,263

APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF COMPONENTS IN FLUIDS

Jiri Janata, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 338,943, Jan. 12, 1982, Pat. No. 4,411,741. This application Oct. 21, 1983, Ser. No. 544,359
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T **20 Claims**



1. An apparatus for detecting a concentration of components in a fluid, comprising:

a semiconductor substrate having a doping polarity;

at least two diffusion regions located at a surface of said substrate;

an electrically insulating layer overlying the surface of said substrate except for that portion of the substrate surface between said diffusion regions;

a bridge member mounted to said insulating layer so as to form a gap between said bridge member and said substrate, said bridge member allowing for passage of fluid into said gap and said bridge member being capable of having an electrical charge imposed upon it, said gap further providing for electrical insulation between said bridge member and the surface of said substrate between said diffusion regions;

means for imposing an electrical charge on said bridge member; and

means for imposing an electrical potential between said diffusion regions.

17. A method for detecting a concentration of components in a fluid, comprising the steps of:

doping a semiconductor substrate so as to impart a doping polarity to the substrate;

forming at least two diffusion regions at the surface of the substrate;

positioning an electrically insulating layer over the surface of the substrate except for that portion of the substrate surface between the diffusion regions;

mounting a bridge member to the insulating layer so as to form a gap between the bridge member and the substrate, the gap providing for electrical insulation between the

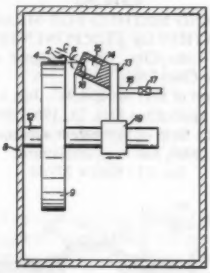
bridge member and the surface of the substrate between the diffusion regions;
imposing an electrical charge on the bridge member;
imposing an electrical potential between the diffusion regions;
introducing a fluid through the bridge member and into the gap between the bridge member and the substrate; and
detecting current flow between the diffusion regions.

4,514,264

METHOD AND DEVICE FOR GALVANICALLY APPLYING A METAL COATING ON METAL OBJECTS

Harry C. Piepers, Eindhoven, Netherlands, assignor to Meco Equipment Engineers B.V., Netherlands

Filed Feb. 21, 1984, Ser. No. 581,930
Int. Cl.³ C25D *5/02, 5/08, 17/28*
U.S. Cl. 204—15 **17 Claims**



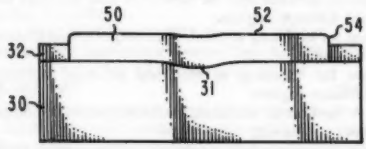
1. A method of galvanically applying a metal coating to metal objects with the aid of an electrolyte which is brought into contact with at least the parts of the metal objects to be covered with metal, the metal objects being guided along the outer circumference of a curved surface, the electrolyte being expelled from a supply means with a speed of at least 3 m/sec. in the form of a thin curtain at least substantially tangential to the parts to be covered with metal of the objects adhering in an elongate tape, so that after having passed along the parts to be covered, the electrolyte can freely flow away without coming into contact with other parts of the objects.

4,514,265

BONDING PADS FOR SEMICONDUCTOR DEVICES

Srinivas T. Rao, Kendall Park, and Frank Z. Hawrylo, Hamilton Township, Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 5, 1984, Ser. No. 627,921
Int. Cl.³ C25D *5/02*
U.S. Cl. 204—15 **5 Claims**



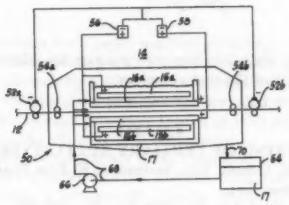
1. In a method of electroplating one or more bonding pads onto the surface of a nonplanar semiconductor body comprising
connecting the semiconductor body to a negative terminal of a power supply;
connecting a suitable anode to a positive terminal of said power supply;
submerging the semiconductor device and the anode into an electrolyte solution of the bonding pad material; and
applying a direct current from the power supply to the electrolyte so that a layer of bonding pad material of the desired thickness is deposited onto the semiconductor body; the improvement comprising
modulating the current such that it is turned off and on continuously during the deposition whereby the nonplanarities are substantially planarized and a bonding pad layer having low stress, a fine grain structure and straight walls is provided.

4,514,266

METHOD AND APPARATUS FOR ELECTROPLATING

Frank J. Cole, and Henry N. Hahn, both of Parma, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Sep. 11, 1981, Ser. No. 301,429
Int. Cl.³ C25D *7/06, 17/12*
U.S. Cl. 204—28 **16 Claims**



1. An apparatus for electroplating at least one surface of a cathodic workpiece in an electrolytic cell comprising:
(a) a structure defining a workpiece position;
(b) a non-consumable anode having a plate with apertures therethrough positioned in a spaced apart relationship with respect to the workpiece plating position and in part defining a first plating solution flow path between the workpiece position and the plate; said non-consumable anode contoured to maintain a substantially uniform spacing between a substantially planar surface of said anode and a substantially planar workpiece plating surface;
(c) a consumable anode positioned outside the first plating solution flow path, in a spaced apart relationship with respect to the workpiece position to define a second solution flow path between the consumable anode and the workpiece through the spaced apertures in said non-consumable anode plate, the relative positioning of the non-consumable and consumable anodes such that said second flow path at least partially co-incides with said first flow path in a region between the apertured plate and said workpiece position;
(d) fluid supply means for supplying an electroplating solution that substantially fills the first and second plating solution flow paths by directing solution past the consumable anode to and through said spaced apertures to permit electroplating current flow between a workpiece and each of the anodes; and,
(e) a power supply for applying a direct current potential between a workpiece and each of the anodes such that the direct current potential between such workpiece and the non-consumable anode is no higher than that between the consumable anode and such workpiece.

11. A process of plating a surface of a steel workpiece with a metal comprising:
(a) positioning an anode chamber in which a non-consumable anode at least in part forms a wall of the chamber in spaced relationship with a workpiece with the non-consumable anode having a surface oriented toward a surface to be plated of the workpiece and maintained in a predetermined spacial relationship with the workpiece surface

such that a desired and predetermined current density can be achieved across the workpiece surface;

(b) positioning a consumable anode in the anode chamber in non-contacting relationship with the non-consumable anode and with the non-consumable anode between the consumable anode and the workpiece surface;

(c) flowing plating solution into said chamber and through apertures in said non-consumable anode into contact with the workpiece;

(d) maintaining the flow at sufficient volume to substantially fill at least a portion of the space between the non-consumable anode surface and the workpiece surface being plated and to maintain the consumable anode at least partially immersed in such solution;

(e) establishing electroplating current flow between the workpiece and each of the anodes by applying direct current potential between the workpiece and each of said anodes, and plating the workpiece surface while maintaining the potential between the consumable anode and the workpiece at least as high as the potential between the non-consumable anode and the workpiece.

4,514,267

ZINC ELECTROPLATING ADDITIVE CONCENTRATE

Ronald J. Lash, Rochester, Mich., assignor to OMI International Corporation, Warren, Mich.

Filed May 7, 1984, Ser. No. 606,464

Int. Cl.³ C25D *3/22, 3/56*

U.S. Cl. 204—44.2 **8 Claims**

1. An aqueous concentrate adapted for dilution with water for use in the make-up and replenishment of zinc or zinc alloy plating baths of the chloride and mixed chloride types comprising an aqueous solution containing zinc chloride present in an amount of about 10 to about 400 g/l, a hydrophobic organic brightening agent selected from the group consisting of aryl aldehydes, halo aryl aldehydes, aryl alkenyl ketones, aryl alkenyl aldehydes, heterocyclic alkenyl ketones, heterocyclic alkenyl aldehydes and mixtures thereof present in an amount of about 10 to about 200 g/l, and a solubilizing agent comprising an alkyl phenyl sulfonate compound, said solubilizing agent present in an amount of at least about 10 g/l up to an amount in combination with said zinc chloride of about 270 g/l to about 570 g/l for each 100 g/l or fraction thereof of said brightening agent present in said concentrate.

4,514,268

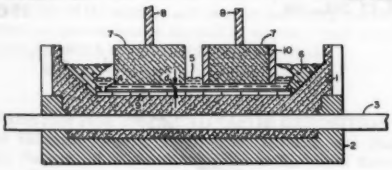
ELECTROLYTIC AL PRODUCTION WITH REACTION SINTERED CERMET COMPONENT

Thomas P. DeAngelis, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,670

Int. Cl.³ C25C *3/06*

U.S. Cl. 204—67 **20 Claims**



1. A component of an electrolytic aluminum production cell which in use is normally in contact with molten aluminum or in electrical contact with another component which is normally in contact with molten aluminum, characterized in that it has a portion made of a fine-grained, homogeneous, intimate interdispersion of:

(a) 30–95 mole percent of first phase or phases having a maximum grain size not greater than about 10 μm and being boride, carbide, nitride, silicide, sulfide or combination thereof of one or more of the elements of Groups 4b, 5b and 6b, and

(b) 5–70 mole percent of second phase or phases being aluminum, alloy or intermetallic compound thereof, or combination thereof;

which cermet contains 0 to 4 weight percent oxygen and is prepared by the process comprising:

(c) admixing particulate reactants of maximum particle size substantially not greater than 150 μm and being elements, compounds, intermetallic compounds, alloys or combination thereof in stoichiometric proportions to substantially form the first and second phases, and

(d) shaping and heating the admixture to form the reactive sintered cermet, the heating being done in nonreactive atmosphere and at temperature at which the reaction and sintering occurs between the reactants to substantially form the first and second phases.

20. In a method of producing aluminum by electrolysis in an electrowinning or electrorefining cell the improvement characterized by using a cell component as claimed in claim 1.

4,514,269

METAL PRODUCTION BY ELECTROLYSIS OF A MOLTEN ELECTROLYTE

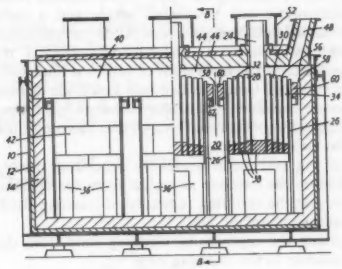
Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jul. 13, 1983, Ser. No. 513,234

Claims priority, application United Kingdom, Aug. 6, 1982, 8222665

Int. Cl.³ C25C *3/02, 3/04*

U.S. Cl. 204—69 **6 Claims**



1. A process for the production of a metal by electrolysis of a molten metal chloride electrolyte which is more dense than the metal, which method comprises,

introducing electrolyte into the lower ends of interelectrode regions between the electrodes of one or more assemblies each comprising an anode, a cathode and one or more intermediate bipolar electrodes,

passing an electric current between the anode and the cathode whereby chlorine is generated at anodic electrode faces, the metal is generated at cathodic electrode faces, and an electrolyte/metal/chlorine mixture is caused to rise up the interelectrode regions,

causing the electrolyte/metal mixture which emerges from the upper ends of the interelectrode regions to spill over the or each intermediate bipolar electrode and over the cathode and to pass down a restricted passage behind the cathode,

maintaining the liquid surface level at a substantially constant height to effect substantially complete separation of chlorine from the electrolyte metal mixture at or upstream of the restricted passage without permitting a significant proportion of electric current to by-pass the intermediate electrode(s), and

downstream of the restricted passage, separating and recov-

ering metal from the electrolyte/metal mixture into an inverted channel leading to a metal collection region and recirculating the electrolyte to the lower ends of the interelectrode regions.

4,514,270

PROCESS FOR REGENERATING CLEANING FLUID

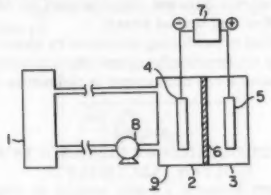
Yasumasa Furutani, Katsuta; Yasuo Hira, Hitachi; Takashi Hasegawa, Ibaraki; Akira Minato, Hitachi; Osao Sumita, Hitachi, and Hisao Itow, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,195

Claims priority, application Japan, Sep. 25, 1981, 56-150627

Int. Cl.³ C25C *1/06;* B01D *13/02*

U.S. Cl. 204—151 **20 Claims**



13. A process for regenerating a cleaning fluid obtained from a cleaning step in nuclear plants, which comprises:

introducing a cleaning fluid containing metal oxides obtained by cleaning operation into a cathode chamber of an electrolytic cell having an anode and a cathode, said cleaning fluid being a chemical decontamination solution containing one or more decontamination reagents in amounts of 1% by weight or less as a total and said electrolytic cell being divided into a cathode chamber and an anode chamber by a cation exchange resin film,

passing a direct current through said cleaning fluid between the two electrodes,

removing said metal oxides by depositing dissolved metal ions on the cathode as metals from the cleaning fluid to recycle the resulting regenerated cleaning fluid from the cathode chamber, and

recycling the regenerated cleaning fluid from the cathode chamber to the cleaning step.

4,514,271

STABLE DISPERSION OF ALKYLATED POLYVINYLPYRROLIDONE AND VINYL PYRROLIDONE

Earl P. Williams, Pen Argyl, Pa., and Lindley S. Wood, Montclair, N.J., assignors to GAF Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 280,032, Jul. 2, 1981, abandoned. This application May 23, 1983, Ser. No. 496,789

Int. Cl.³ C08F *2/50, 271/02*

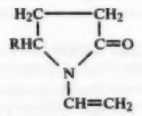
U.S. Cl. 204—159.15 **11 Claims**

1. Composition consisting essentially of:

a. Poly(alkylated vinylpyrrolidone) which is a linear copolymer of:

1. alpha olefin having at least two carbon atoms; and

2. N vinyl monomer of the formula



where R represents H, CH_3 and C_2H_5; and

b. N-vinyl-2-pyrrolidone as diluent monomer, the N-vinyl-2-pyrrolidone being present in an amount between about 25 and about 30 wt % based on the total of N-vinyl-2-pyrrolidone and poly(alkylated vinylpyrrolidone).

6. Method of forming a radiation cured coating which comprises:

a. forming composition of claim 1;

b. mixing a minor amount of said composition of claim 1 as a dispersion aid with a multi-component radiation curable coating composition having as a component N-vinyl-2-pyrrolidone;

c. forming said radiation curable coating composition into an uncured coating; and

d. subjecting said coating to radiation to produce a cured coating.

4,514,272

PROCESS AND DEVICE FOR BREAKING STABILIZED EMULSIONS, ESPECIALLY OIL-WATER EMULSIONS

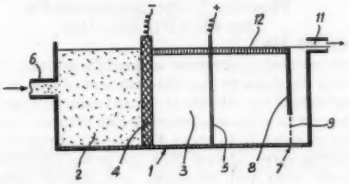
Jean-Pierre Dubreuil, Lagor; Jean Blazejczak, and Bernard Tramier, both of Billere, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Feb. 21, 1984, Ser. No. 581,800

Claims priority, application France, Feb. 21, 1983, 83 02746

Int. Cl.³ B01D *17/06;* B03C *5/00*

U.S. Cl. 204—186 **17 Claims**



1. Process to break stabilized emulsions, comprising feeding an emulsion into a space defined in part by one face of a surfactant treated permeable membrane constituting a precolating electrode, applying an electric current to the membrane, and removing effluent flowing through the membrane from a space defined in part by another face of the permeable membrane.

4,514,273

APPARATUS FOR STIMULATING REMOVAL OF ELECTROLYTIC ENERGY FROM FLUIDS

Leonard L. Vollman, St. Louis County, Mo., assignor to Scale Free Systems, Inc., St. Louis, Mo.

Filed Feb. 8, 1984, Ser. No. 578,271

Int. Cl.³ C23F *13/00;* H05F *3/02*

U.S. Cl. 204—196 **17 Claims**

1. An apparatus for stimulating removal of electrolytic energy from a vessel of water or other charge conveying liquid, said apparatus including a conductive member provided for disposition within the vessel and below its waterline, a conductor electrically connecting with said conductive member and provided for extending externally of any vessel in which the said member is disposed, said conductor capable of being

grounded, a nonconductive mounting means secured with the conductive member and disposed for electrically insulating the said member from the vessel in which it is disposed, said mounting means being nonabsorbent of moisture and free of electrical conductivity even after its sustained submersion in water within the vessel, a projecting means mounted upon the conductive member and extending substantially along its length from its connection with the mounting means and to its most inwardly disposed end within the vessel, whereby the said conductive member and its projecting means retains an electrically isolated state with respect to the vessel in which it mounts and is capable of conducting electrostatic charge from the water located in any such vessel.

4,514,274

ELECTRODE FOR ELECTROCHEMICAL PROCESSES

Bernard Hesketh, Frodsham, and Nicholas W. J. Pumphrey, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 450,200, Mar. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 289,742, Sep. 15, 1972, abandoned. This application Nov. 8, 1979, Ser. No. 92,515

Claims priority, application United Kingdom, Sep. 16, 1971, 43190/71; Oct. 26, 1973, 49898/73

Int. Cl.³ C25B *11/00*

U.S. Cl. 204—290 F **12 Claims**

1. In an electrode suitable for use as an anode in a mercury cathode cell which comprises a support member made of a film-forming metal or a film-forming metal alloy and an electrocatalytically active coating thereon comprising an electroconducting material selected from the group consisting of platinum group metals, oxides thereof and mixtures of at least one such metal or oxide with one or more non-noble metal oxides, such coating being obtained by thermally decomposing a precursor for each component thereof, the improvement whereby said coating consists of a matrix of said electroconducting material having embedded therein a non-conducting refractory material in discrete form and having a resistivity greater than about 10 ohms-cm, said embedded refractory material being selected from the group consisting of:

(a) particulate non-conducting refractory material wherein the particles have a size range of up to 200 microns,

(b) fibrous non-conducting refractory material wherein no dimension of individual fibers exceeds 1 mm and

(c) mixtures of such fibrous and particulate refractory material, the embedded refractory material being present in particulate and/or fibrous form in admixture with the precursors for said coating before said precursors are thermally decomposed to form said coating and remaining essentially in said form throughout the preparation of said coating, the proportion of embedded refractory material in the coating being 5% to 95% by volume calculated on the total volume of the components in the coating, said embedded refractory material modifying the surface characteristics of the coating and thereby increasing the electrical contact resistance thereof to mercury with consequent reduction in undesirable shorting effects.

4,514,275

APPARATUS FOR PHYSICAL VAPOR DEPOSITION

Hisashi Shimada, Nagoya; Tohru Arai, Toyoake, and Junji Endo, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Continuation-in-part of Ser. No. 345,423, Feb. 3, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 594,444

Claims priority, application Japan, Feb. 12, 1981, 56-20495

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **13 Claims**

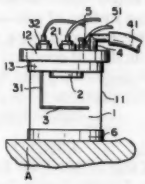
1. An apparatus for physical vapor deposition for coating a surface to be treated of a large or immovable body comprising:

a casing having an opening at one end thereof;

a sealing member provided at an opening end of said casing in contact with said surface to be treated, for air-tightly sealing a vacuum chamber formed by said casing and said surface to be treated;

electrode means for sputtering provided in said vacuum chamber and connected to a power source for emitting vapor of coating material to said surface to be treated;

a bias electrode comprising a ring-shaped member, having a larger diameter than the diameter of said electrode means, provided in said vacuum chamber between said electrode



means and said surface to be treated and connected to a power source so as to have a higher potential than said surface to be treated and said electrode means;

an exhaust hole provided at a predetermined wall portion of said casing, for exhausting gases from said casing; and

a gas introducing hole provided at a predetermined wall portion of said casing independently of said exhaust hole for introducing a specific gas into said casing, whereby said emitted vapor reaches said surface to be treated.

4,514,276

MICROELECTRONIC SENSOR ASSEMBLY

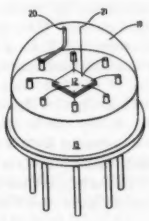
Arthur K. Covington, Newcastle Upon Tyne, and Alastair Sibbald, Whitley Bay, both of England, assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,710

Claims priority, application United Kingdom, Oct. 31, 1981, 8132895

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—415 **5 Claims**



1. A miniature sensor assembly for the detection and electrochemical measurement of oxygen and other chemical properties of the environment to which it is exposed, said sensor comprising:

an electrically insulating substrate comprising a microelectronic header having a first surface,

an integrated circuit amplifier mounted on said first surface of said substrate, said amplifier having at least an input terminal,

a plurality of conductive posts situated around the periphery of said first surface of said substrate, said amplifier being centrally disposed with respect to said posts,

said amplifier, said plurality of conductive posts, and the adjacent surface of said substrate being encapsulated in a chemically-resistant, electrically inert material having at least one exposed surface,

a first noble metal wire connected at one end thereof to one

of said conductive posts, said noble metal wire being connected at a point between the ends thereof to said amplifier input terminal, the end of said first noble metal wire opposite said one end extending from said amplifier input terminal in a direction substantially perpendicular to the first surface of said header and terminating at said exposed surface of said electrically inert material, and

a conductive electrode encapsulated in said electrically inert material, one end of said conductive electrode terminating at said exposed surface of said electrically inert material, said conductive electrode being electrically connected to one of said plurality of conductive posts, said electrically inert material surrounding said first noble metal wire and said conductive electrode throughout their entire lengths.

4,514,277

OXYGEN SENSOR ELEMENT

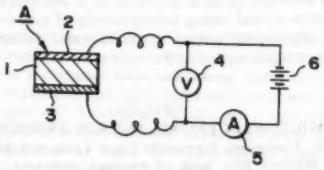
Shigenori Sakurai; Takashi Kamo; Toshinobu Furutani; Shirou Kimura; Yoshio Torisu, all of Toyota, and Mari Okazaki, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 30, 1982, Ser. No. 429,458

Claims priority, application Japan, Dec. 24, 1981, 56-210311

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—424 **2 Claims**



1. An oxygen sensor element of an oxygen sensor of an oxygen concentration cell comprising an oxygen ion-permeable solid electrolyte shaped in a tabular or columnar shape, with electrode layers formed on both sides of said solid electrolyte, wherein at least one of said electrode layers consists of a uniform fired body containing 100 weight parts of metal powder and 0.1 to 10 weight parts of glass powder consisting of particles having a diameter of 5 to 20 micrometers, and wherein said glass powder consists of reinforcing glass fiber for cement, which consists of the following materials in molar amounts: SiO_2, 62–75%; ZrO_2, 7–11%; R_2O, 13–23%; R'O, 1–10%, Al_2O_3, 0–4%; B_2O_3, 0–6%; Fe_2O_3, 0–5%, CaF_2, 0–2%; and TiO_2, 0–4%; wherein R_2O is Na_2O which is substantially pure or is substituted by Li_2O within 2 mole percent thereof, and R'O is an oxide selected from the group consisting of the alkaline-earth metal oxides, ZnO and MnO.

4,514,278

TRACE WATER SENSOR

James B. Stephens, LaCrescenta; Mary M. Yang, Berkeley, and Eric G. Laue, San Marino, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 14, 1983, Ser. No. 457,992

Int. Cl.³ G01N *27/46*

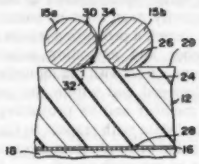
U.S. Cl. 204—430 **5 Claims**

1. A moisture sensor comprising:

a layer of hygroscopic electrolytic material having first and second opposite faces;

first and second electrodes laying respectively against said first and second faces of said layer;

said second electrode comprising a multiplicity of juxtaposed wire portions lying against said layer and extending parallel to one another, wherein each wire portion abuts the adjacent wire portion to leave only gaps primarily due to variations in wire width and wherein said second face



of the electrolytic material is exposed to the ambient through said gaps.

4,514,279

SOLID HYDROCARBON LIQUEFACTION WITH A CATALYST HAVING CHROMIUM AND MOLYBDENUM

John A. Mahoney, Glen Ellyn; John J. Helstrom, and A. Martin Tait, both of Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 25, 1983, Ser. No. 555,173

Int. Cl.³ C10G *1/08*

U.S. Cl. 208—10 **5 Claims**

1. A method for recovering upgraded liquid products from a solid carbonaceous material, comprising: contacting the carbonaceous material with hydrogen under hydrogenation conditions comprising a temperature in the range of from about 300° C. to about 500° C. in the presence of a hydrocarbon conversion catalyst consisting essentially of molybdenum component and a chromium component on porous refractory inorganic oxide support particles and having a surface area of from about 140 m^2/gm to about 300 m^2/gm, a total pore volume, as determined by mercury penetration and nitrogen desorption measurements, of from about 0.4 cc/gm to about 1.2 cc/gm, a bimodal pore volume distribution with at least about 3% of its total pore volume in macropores having pore diameters greater than 600 Å and at least about 60% of its total pore volume in micropores having pore diameters less than 600 Å, with an average micropore diameter of from about 100 Å to about 200 Å, with each metal component being in the form of the elemental metal, its oxide or sulfide or a mixture thereof, with the molybdenum component at a concentration of from about 3 wt % to about 30 wt %, calculated as MoO_3 and based on the weight of the catalyst, and with the chromium component at a concentration of from about 2 wt % to about 20 wt %, calculated as Cr_2O_3 and based on the weight of the catalyst, and wherein, when the carbonaceous material is coal, coke, lignite or biomass, the carbonaceous material is also contacted with a hydrogen-donor solvent.

4,514,280

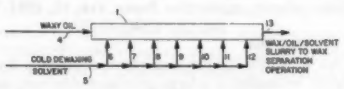
DEWAXING WAXY OIL BY DILUTION CHILLING EMPLOYING STATIC MIXING MEANS

David H. Shaw, Sarnia, Canada, and Ralph R. Hall, Morristown, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 582,652, Jun. 2, 1975, abandoned. This application Nov. 24, 1978, Ser. No. 963,577

Int. Cl.³ C10G *73/06*

U.S. Cl. 208—33 **2 Claims**



1. In a continuous solvent dewaxing process for separating

solid wax from waxy petroleum distillate oil stock, wherein said waxy oil stock, heated for dissolving all wax therein, is treated with dewaxing solvent in a volume ratio of solvent to oil of about 1.5:1 to 5:1, wherein the oil/solvent mixture is cooled at a rate below about 10° F./min. to a temperature for forming a mixture of wax crystals in oil-solvent solution, wherein said wax/oil/solvent mixture is separated, in a solid-liquid separation zone, into a dewaxed oil-solvent solution and wax; the improvement which comprises:

(a) heating a continuously flowing mixture of waxy oil stock and aromatic hydrocarbon dewaxing solvent to a temperature above the melting point of solid wax for forming a waxy oil/aromatic solvent solution;

(b) cooling said heated waxy oil/aromatic solvent solution, at a rate below about 10° F./min. to a dewaxing temperature for crystallizing wax and forming a wax/oil/aromatic solvent mixture;

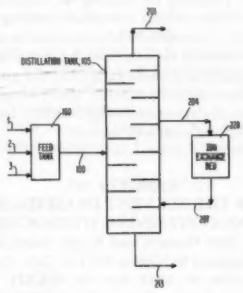
(c) mixing said wax/oil/aromatic solvent mixture with cold ketone dewaxing solvent, under conditions of plug flow radial mixing, to form a second wax/oil/solvent mixture; and

(d) flowing said second wax/oil/solvent mixture, at said dewaxing temperature, to said solid-liquid separation.

4,514,281
CORROSION INHIBITION FOR DISTILLATION APPARATUS

Kenneth L. Baumert, Emmaus, Pa.; Alberto A. Sagues, Lexington; Burtron H. Davis, Georgetown, both of Ky., and Frank K. Schweighardt, Upper Macungie, Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Mar. 21, 1984, Ser. No. 591,665
Int. Cl.³ C10G 7/10, 45/02
U.S. Cl. 208—47 **3 Claims**



1. In a coal liquifaction system including a distillation tower having trays for holding distilling materials, the improvement wherein chloride-amine-complex-containing-streams accumulated in the 400° to 450° F. range trays of said tower are removed from said tower, contacted with a chloride ion exchange material for removal of a substantial fraction of said chloride contained in said streams, and returned to said tower for further distillation.

4,514,282
HYDROGEN DONOR DILUENT CRACKING PROCESS

Paul C. Poynor, and Joseph W. Burdett, both of Ponca City, Okla., assignors to Conoca Inc., Ponca City, Okla.

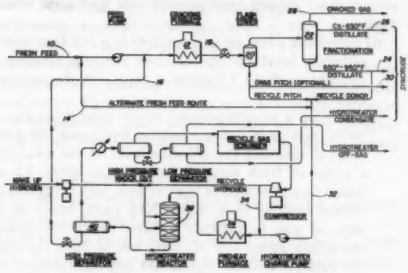
Filed Jul. 21, 1983, Ser. No. 515,733
Int. Cl.³ C10G 69/06
U.S. Cl. 208—56 **8 Claims**

1. A process for converting heavy hydrocarbonaceous oil into lighter distillate products comprising:

(a) thermally cracking said oil in the presence of a hydrogen donor solvent to produce distillate products and residual pitch;

(b) recovering recycle donor solvent from said distillate products;

(c) catalytically hydrotreating said recycle donor solvent and at least a part of said residual pitch;



(d) combining hydrotreated recycle donor solvent and hydrotreated residual pitch with additional heavy hydrocarbonaceous oil; and

(e) subjecting said combined materials to thermal cracking as in step (a).

4,514,283
PROCESS FOR SEPARATING AND CONVERTING HEAVY OIL ASPHALTENES IN A FIELD LOCATION

Philip J. Closmann; Monroe H. Waxman, and Charles T. Deeds, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 26, 1984, Ser. No. 574,303
Int. Cl.³ C10G 53/04, 55/04
U.S. Cl. 208—86 **5 Claims**

1. A process for treating at least the relatively high boiling components of an asphaltenic viscous crude oil in a field location, in order to produce a pumpable liquid oil product, comprising:

mixing the crude oil or its heavy ends with an asphaltene precipitating agent at least as effective for asphaltene precipitation as normal heptane and recovering at least a portion of the precipitated asphaltenic components of the crude oil;

thermally converting the recovered asphaltenic components to non-viscous liquid asphaltenic conversion products by heating said recovered asphaltenic components at a pressure of from about one to three atmospheres for a time and temperature substantially as effective as heating said recovered asphaltenic components at substantially atmospheric pressure at from about 625° F. to 700° F. for from about one to three days; and

mixing products of said conversion comprising the non-viscous liquid asphaltenic conversion products with at least the maltene components of the crude oil or its heavy ends from which asphaltenic components were precipitated in order to form a pumpable liquid oil product having a viscosity of no more than about 10,000 centipoise.

4,514,284
REACTIVATION OF IRIDIUM-CONTAINING CATALYSTS

Tom Wairegi, Burlington; Joseph P. Boyle, and John B. Gilbert, both of Sarnia, all of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 24, 1984, Ser. No. 643,798
Int. Cl.³ B01J 23/90
U.S. Cl. 208—140 **17 Claims**

1. In a process for the catalytic conversion of hydrocarbons

wherein a hydrocarbon feedstock is contacted with a catalyst comprised of an iridium component composited with a porous refractory inorganic oxide support at hydrocarbon conversion conditions, the catalyst having been at least partially deactivated during contact with said feedstock by coke deposition thereon, the steps of regenerating said catalyst after discontinuing contact of said catalyst with said feedstock which comprise:

(i) providing a bed of said catalyst in a reaction zone with a chloride level on the catalyst ranging from about 0.9 percent to about 1.5 percent, based on the weight of the catalyst,

(ii) burning a preponderance of the coke from the catalyst while adding a gas containing hydrogen chloride sufficient to maintain the chloride level on the catalyst within a range of from about 0.9 percent to about 1.5 percent, based on the weight of the catalyst, and oxygen in concentration ranging up to about 5000 parts, based on the volume of gas, to provide a flame front temperature not exceeding about 425° C. sufficient to burn the coke from the catalyst without significant agglomeration of the iridium component of the catalyst,

(iii) increasing further the chloride level of the catalyst to at least about 1.6 percent, based on the weight of the catalyst, and then contacting said catalyst with a gas containing hydrogen chloride at up to about 5000 parts, based on the volume of the gas, and up to about 5000 parts per million parts oxygen, based on the volume of the gas to provide a flame front temperature greater than about 425° C. sufficient to substantially complete the removal of coke from the catalyst without agglomeration of the iridium component of the catalyst.

4,514,285

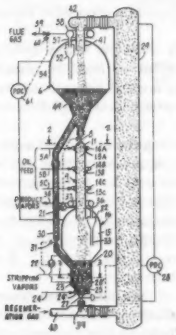
CATALYTIC CRACKING SYSTEM

Phillip K. Niccum, and Dorrance P. Bunn, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 23, 1983, Ser. No. 478,018

Int. Cl.[3] **C10G** *11/14;* **F27B** *15/08*

U.S. Cl. 208—148 **5 Claims**



1. In a fluidized catalytic hydrocarbon cracking process wherein hydrocarbon conversion is carried out in a downflow transport type reaction zone in the presence of hot freshly regenerated catalyst, spent catalyst from said reaction zone is separated from reaction products and stripped of volatile hydrocarbons in a fluidized bed catalyst stripping zone, stripped catalyst is regenerated with an oxygen-containing gas in a catalyst regeneration zone, and hot freshly regenerated fluid catalytic cracking catalyst from the regeneration zone is supplied by gravity in the absence of a carrier fluid into the upper end of a vertical transport downflow reaction zone of relatively small cross-sectional area as compared with its length the improvement which comprises discharging reaction products and catalyst from said reaction zone axially downward directly into the upper portion of an unobstructed ballistic separation zone having a cross-sectional area within the range of 20 to 30 times the cross-sectional area of said reaction zone and open at its lower end to said stripping zone thereby permitting unobstructed free fall of catalyst under the influence of gravity from said reaction zone through said separation zone directly into said stripping zone, introducing hydrocarbon feedstock into said reaction zone along the path of flow of said catalyst forming a mixture consisting of regenerated cracking catalyst and hydrocarbon feedstock vapors at an elevated temperature in the range of 900° F. to 1100° F., maintaining contact between catalyst and hydrocarbon reactants in said reaction zone for an average contact time in the range of 0.5 to 5 seconds, maintaining a fluidized bed level in said stripping zone well below the discharge end of said reaction zone, and effecting substantially complete separation of spent catalyst from hydrocarbon conversion products in said separation zone solely by particle inertia and gravity, withdrawing hydrocarbon conversion products separated from said catalyst in said separation zone at substantially the level of discharge from said reaction zone such that said products are drawn horizontally outward away from the downwardly moving catalyst particles in said separation zone, and collecting separated catalyst from said ballistic separation zone in a fluidized bed in said stripping zone.

4,514,286

FUEL SWEETENING WITH ORGANIC PEROXIDES

Sophia Wang, Houston; Glenn L. Roof, Sugar Land, and Beth W. Porlier, Missouri City, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 21, 1983, Ser. No. 544,163

Int. Cl.[3] **C10G** *27/06*

U.S. Cl. 208—196 **5 Claims**

1. A process for reducing the mercaptan concentration of a sour petroleum distillate which comprises treating said petroleum distillate with a hydroperoxide compound in combination with a strong base catalyst chosen from the group consisting of quaternary ammonium hydroxide salts from the group consisting of tetraethylammonium hydroxide, tetrapropylammonium hydroxide, tetremethylammonium hydroxide, tetrabutylammonium hydroxide, and mixtures thereof.

4,514,287

PROCESS FOR THE SOLVENT DEASPHALTING OF ASPHALTENE-CONTAINING HYDROCARBONS

Masaki Ikematsu; Isao Honzyo, and Kazuo Sakai, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,831

Claims priority, application Japan, Jan. 8, 1982, 57-999; Apr. 2, 1982, 57-53695; Apr. 2, 1982, 57-53696; Apr. 2, 1982, 57-53933; Apr. 2, 1982, 57-53934

Int. Cl.[3] **C10G** *21/06, 25/00*

U.S. Cl. 208—309 **7 Claims**

1. A process for the solvent deasphalting of asphaltene-containing hydrocarbon which comprises (I) mixing

(A) 100 parts by weight of asphaltene-containing hydrocarbon with

(B) 0.05–10 parts by weight per 100 parts by weight of said asphaltene-containing hydrocarbon of aluminum sulfate

(C) 50–2,000 parts by weight per 100 parts by weight of said asphaltene-containing hydrocarbon of at least one solvent selected from the group consisting of

(1) aliphatic and alicyclic hydrocarbons having 3–30 carbon atoms,

(2) saturated aliphatic and saturated alicyclic monohydric alcohols,

(3) liquid hydrogen sulfide, and

(4) liquid carbon dioxide

to form a mixture of the materials (A), (B) and (C) and then (II) allowing the thus formed mixture to stand still to precipitate and separate the asphaltene therefrom thereby obtaining a

deasphalted oil, wherein the step of mixing, precipitation and separation of the asphaltene are effected at a temperature of 20°-200° C. and a pressure of 0.5-150 kg/cm^2 with the proviso that the lower limit of the pressure is such that the solvent used does not evaporate at the temperature used.

4,514,288

ORE BENEFICIATION PROCESS

Ross A. Kremer, Ringoes, and Stephen W. Saunders, Plainsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,765
Int. Cl.^{3} B03B *1/00*
U.S. Cl. 209—5 **8 Claims**

1. A method for modifying the formation of clay suspensions and phosphate ore beneficiation, whereby the clays coagulate and consolidate more rapidly to a higher final clay density, which comprises adding to a phosphate matrix slurry of the phosphate ore, prior to classification and froth flotation a minor amount of ethylenediaminetetraacetic acid of the formula

$$(HOOCCH_2)_2NCH_2CH_2N(CH_2COOH)_2$$

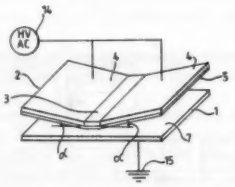
followed by classification and forth flotation with recovery of phosphate.

4,514,289

METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIALS

Ion I. Inculet, London, Canada, assignor to Blue Circle Industries PLC, London, England

Filed Nov. 15, 1983, Ser. No. 551,916
Claims priority, application United Kingdom, Nov. 17, 1982, 8232853
Int. Cl.^{3} B03C *7/04*
U.S. Cl. 209—127.3 **21 Claims**



1. A method of separating particles having different physical properties, which comprises generating an alternating electric field; introducing the particles into the field; charging at least some of the particles; and causing the particles to move along a path in the field in a given direction; characterized in that the electric field has a first region having field lines curved convexly in a first direction away from said path and generally perpendicular to said given direction and has a second region having field lines curved convexly in a second direction away from said path and generally perpendicular to said given direction, whereby a charged particle acted upon by the electric field in either of the first and second regions is subjected to a centrifugal force in the respective first or second direction.

4,514,290

FLOTATION COLLECTOR COMPOSITION AND ITS USE

Piotr Swiatkowski, Huddinge, and Thomas Wiklund, Nacka, both of Sweden, assignors to KenoGard AB, Stockholm, Sweden

Filed Mar. 1, 1983, Ser. No. 471,006
Claims priority, application Sweden, Mar. 5, 1982, 8201363
Int. Cl.^{3} B03D *1/14*
U.S. Cl. 209—166 **13 Claims**

1. A process for separation of apatite, scheelite, magnesite, baryte, calcite or fluorspar minerals which contain calcium, barium or magnesium from silica, silicate or iron mineral gangues by froth flotation which process comprises the steps of:

(1) forming a pulp of the raw mineral,

(2) treating the pulp with an effective amount of a collector composition comprising a combination of

(a) 5 to 85 percent by weight of a fatty acid or a salt thereof,

(b) 10 to 75 percent by weight of an amidocarboxylic acid or an amidosulfonic acid, or a salt thereof, and

(c) 3 to 40 percent by weight of a partial ester of phosphoric acid and at least one alkoxylated alcohol, and

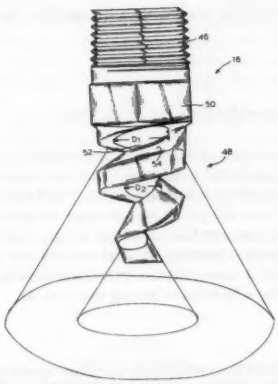
(3) separating the apatite, scheelite, magnesite, baryte, calcite or fluorspar minerals containing calcium, barium or magnesium by flotation at a pH above 6 and collecting them as froth product, and removing the gangues as tailings.

4,514,291

APPARATUS AND METHOD FOR FLOTATION SEPARATION UTILIZING AN IMPROVED SPIRAL SPRAY NOZZLE

Phillip E. McGarry, Palmerton; David E. Herman, Jim Thorpe; Robert A. Treskot, Walnutport, and David C. Fistner, Sr., Bethlehem, all of Pa., assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 18, 1983, Ser. No. 495,626
Int. Cl.^{3} B03D *1/14*
U.S. Cl. 209—166 **7 Claims**



5. A method for froth flotation separation of the components of a slurry having particulate coal therein, said method comprising the steps of:

a. spraying, under pressure in a range of from 2 to 25 psig and under a relatively low back pressure, an input slurry having particulate coal therein through at least one 50° spiral, open flow spray nozzle adapted to cause a hollow cone spray pattern of fine droplets so that the particulate coal is dispersed through an aeration zone of increasing cross-sectional area into a liquid surface to create a froth on the surface in which a quantity of the particulate coal is floating;

b. controlling the agitation created by said at least one spiral spray nozzle to provide a zone of turbulence extending a limited distance beneath the liquid surface; and

c. removing the froth from the liquid surface.

4,514,292

FROTH FLOTATION PROCESS

Charles L. Burdick, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 9, 1983, Ser. No. 550,163

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—167 **8 Claims**

4. In the beneficiation of ores containing metallic minerals or coal by subjecting an aqueous pulp of said ore or coal to a froth flotation process in the presence of a depressant for associated gangue and ash-producing constituents and recovering the beneficiated minerals or coal as a flotation froth concentrate, the improvement wherein the depressant is a water-soluble composition consisting essentially of, by weight, (a) from about 95% to about 5% of at least one salt selected from the group consisting of alkali metal sulfite, ammonium sulfite, alkali metal bisulfite and ammonium bisulfite and (b) from about 5% to about 95% of at least one salt of a sulfonated compound selected from the group consisting of benzene disulfonic acids, naphthalene disulfonic acids, condensates of formaldehyde and naphthalene sulfonic acids, naphthol sulfonic acids, lignin sulfonic acids and sulfonated quebracho.

4,514,293

ORE FLOTATION AND FLOTATION AGENTS FOR USE THEREIN

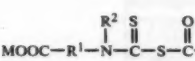
Clarence R. Bresson, and Harold W. Mark, both c/o French, Hughes and Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Filed May 10, 1984, Ser. No. 608,826

Int. Cl.³ B03D *1/06*; C07C *154/02*; C09K *3/00*; C22B *3/00*

U.S. Cl. 209—167 **19 Claims**

5. A process for producing a composition having the formula



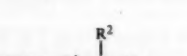
(I)

wherein M is selected from the group consisting of ammonium and alkali metals, R^1 is selected from the group consisting of alkylene radicals each having no more that 4 carbon atoms, R^2 is selected from the group consisting of H, and alkyl radicals each having no more than 2 carbon atoms, and R^3 is selected from the group consisting of alkyl and alkenyl radicals each having no more than 6 carbon atoms, comprising the steps of:

(a) reacting a hydroxide having the formula

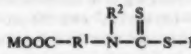
(II),

wherein M is selected from the group consisting of ammonium and alkali metals, with CS_2 and an acid having the formula



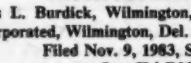
(III)

wherein R^1 is selected from the group consisting of alkylene radicals each having no more than 4 carbon atoms, and R^2 is selected from the group consisting of H and alkyl radicals each having no more than 2 carbon atoms, to form



(IV)

(b) reacting the product of formula (IV) with a haloformic ester having the formula



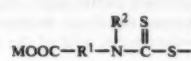
(V)

wherein X is selected from the group consisting of Cl, Br, and I, and R^3 is selected from the group consisting of alkyl and alkenyl radicals each having no more than 6 atoms, to form a composition having the formula (I); and

(c) recovering said thus formed composition as the product of the process.

15. A process for recovering minerals comprising:

(a) mixing crushed ore containing minerals, water and a composition having the formula



(I)

wherein M is selected from the group consisting of ammonium and alkali metals from, R^1 is selected from the group consisting of alkylene radicals each having no more than 4 carbon atoms, R^2 is selected from the group consisting of H, and alkyl radicals each having no more than 6 carbon atoms, and R^3 is selected from the group consisting of alkyl and alkenyl radicals, to establish a pulp;

(b) aerating said thus established pulp to produce a froth containing said minerals; and

(c) recovering said minerals from said thus produced froth.

4,514,294

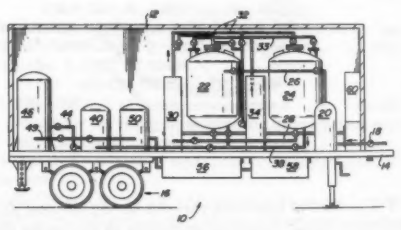
APPARATUS FOR DECONTAMINATING HYDROCARBONS CONTAINING PCB

Robert G. Layman, Box 417 R, Barto, Pa. 19504, and Linwood B. Kemp, 5 Rega La., Birdsboro, Pa. 19508, assignors to Robert G. Layman and Linwood B. Kemp, both of Birdsboro, Pa.

Filed Oct. 3, 1983, Ser. No. 538,307

Int. Cl.³ B01D *57/00*

U.S. Cl. 210—87 **6 Claims**



1. Apparatus for removing PCB from hydrocarbons comprising a common support for the following components and the components themselves:

a filter for removing water from hydrocarbons, a reactor, a heat exchanger for heating hydrocarbons containing PCB, a vessel selectively communicating with said reactor for introducing sodium into the hydrocarbons for reacting with the chlorine in the PCB, and a separator for separating reactant sodium chloride and phenyl polymer from the hydrocarbon having less than two ppm PCB, the outlet of said filter being connected to said reactor, an outlet of said

reactor being coupled to an inlet of said heat exchanger and an outlet of said heat exchanger being coupled to an inlet of said reactor so that hydrocarbon containing PCB may flow through a closed circuit including said reactor and said heat exchanger, an outlet of said reactor being coupled to an inlet of said vessel and an outlet of said vessel being connected to an inlet of said reactor so that hydrocarbons containing PCB may selectively flow through a closed circuit including said reactor and said vessel, an outlet of said reactor being connected to an inlet of said separator.

4,514,295

DIALYSIS APPARATUS

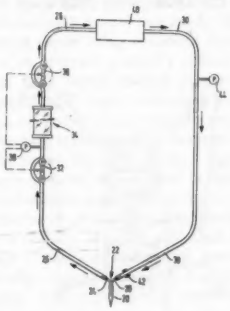
Bernd Mathieu, Spiesen, and Hans-Dietrich Polaschegg, Oberursel, both of Fed. Rep. of Germany, assignors to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,557

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131075

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—90 **17 Claims**



1. Apparatus for freeing blood of products of metabolism comprising

a dialysis diaphragm having

a first access means to one side thereof for receipt of blood to be treated and a first outlet means therefrom for the treated blood,

a second access means to the other side thereof for the dialysis fluid and a second outflow means therefrom for said fluid,

a single connection means for connecting said apparatus to the blood vessel of the patient in need of treatment,

a first pipe means for leading blood from said connecting means to said first access means,

a second pipe means for connecting said first outflow means back to said single connecting means,

valve means in said first and said second pipe means,

at least one pump for driving the blood through the apparatus,

control means for opening and closing said valve means and controlling said pump means,

and an accumulator located in one of said blood pipes, said accumulator comprising a housing having at least one opening therein and a flexible pipe of high elasticity mounted inside said housing having jointing connections at both ends thereof, said opening in said housing providing pressure communication means between the interior of said housing and the atmosphere surrounding said housing.

4,514,296

APPARATUS FOR PRODUCING ION EXCHANGE PARTICLES CHARGED WITH URANYL IONS

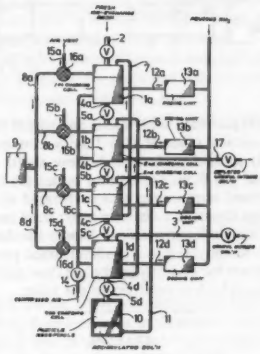
Helmut Ringel, Niederzier-Hambach; Erich Zimmer, Jülich, and Nabil Abdelmonem, Niederzier-Hambach, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Division of Ser. No. 926,103, Jul. 19, 1978, Pat. No. 4,279,866. This application Jan. 5, 1981, Ser. No. 222,640

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733396

Int. Cl.³ B01J *8/08*

U.S. Cl. 210—96.1 **4 Claims**



1. An apparatus for charging weakly acidic cationic ion exchange resin particles with uranyl ions comprising:

at least two contactors arranged in a vertical cascade one above the other;

means for introducing fresh resin particles into the uppermost contactor;

closeable conduits connecting said uppermost contactor with the next lower contactor and connecting the next lower contactor with a further contactor therebelow;

means for introducing a uranyl nitrate solution having relatively high uranyl ion concentration into said further contactor;

means for transferring uranyl nitrate solutions of progressively reduced uranyl ion concentration from said further contactor to said next lower contactor and from said next lower contactor to said uppermost contactor;

means for withdrawing a depleted solution from said next lower contactor; and

means for metering the flow of an alkaline agent into each of said contactors to maintain a pH level therein optimum for the maximum transfer of uranyl ions to the particles therein.

4,514,297

BIOREACTOR

Johan R. Enqvist, Kauniainen, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Dec. 7, 1983, Ser. No. 558,931

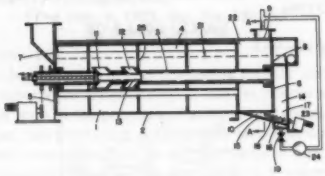
Claims priority, application Finland, Dec. 9, 1982, 824229

Int. Cl.³ C12M *1/06, 1/02*; C02F *3/28*

U.S. Cl. 210—194 **2 Claims**

1. A reactor for anaerobic digestion of an organic sludge and for the production of methane gas, comprising an essentially horizontal, cylindrical vessel (1) having an inlet end and an outlet end, an inlet (7) for the sludge at the inlet end of the vessel, a first outlet for the digested sludge (8) at the opposite outlet end, means for stirring the sludge in the proximity of the inlet end and throughout a major portion of the vessel and

extending up to the outlet end, a second outlet (9) for the removal of methane gas connected to a gas chamber in the upper portion of the vessel, means for returning the sludge settled at the bottom of the vessel at the outlet end to the inlet end, comprising a first channel (10) with an inclined bottom in the lowermost point of the vessel at the outlet end for receiving the settled sludge, said inclined bottom having perforations, a second channel (14) at the outlet end of the vessel, said means for stirring the sludge comprising a horizontal hollow perforated shaft (3) provided with blades and means for rotating said shaft, said second channel (14) fluidly connecting said first channel (10) to said perforated hollow shaft, means for discharging said gas from the second outlet (9) to said channel with an inclined bottom and said perforated shaft is provided with openings disposed a distance apart from each other in the direction of the shaft and a slide is disposed in the shaft to guide the solids to be recycled to a predetermined part of the vessel and valve means for controlling the gas flow and the amount of settled sludge which is returned to the inlet.



4,514,298

TUBE PRESSURE FILTER

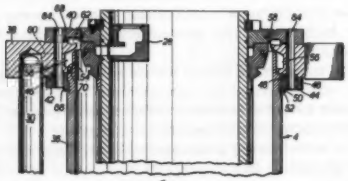
George W. Wall, Par, and Glyn T. Jones, St. Austell, both of England, assignors to English Clays Lovering Pochin & Company, Ltd., Cornwall, England

Filed Feb. 2, 1984, Ser. No. 576,103

Claims priority, application United Kingdom, Feb. 7, 1983, 8303306

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—232 13 Claims



13. A tube pressure filter comprising:

an inner assembly;

a generally tubular outer assembly which surrounds the inner assembly to provide between the assemblies an annular chamber;

an impermeable diaphragm which is disposed within the outer assembly and which divides the annular chamber into inner and outer compartments;

a filter element disposed within the inner compartment;

means for supplying a mixture of a liquid and a particulate solid to the inner compartment; and

means for supplying fluid under pressure to the outer compartment so as to cause the liquid in the inner compartment to be forced through the filter element leaving the particulate solid material deposited on the filter element, the outer assembly comprising a central cylindrical member and two end assemblies, at least one of the end assemblies comprising a first annular member which defines with the cylindrical member an annular chamber for receiving the fluid under pressure and passage means extending between the annular chamber and the outer compartment, and retaining means which releasably engages the cylindrical member and to which the annular member is releasably secured to retain the annular member on the cylindrical member, a second annular member, and at least one nut and bolt assembly which releasably secures together the first and second annular members and the retaining means.

4,514,299

APPARATUS FOR THE RECOVERY OF OILS OR OTHER SIMILAR POLLUTANTS FLOATING ON BODIES OF WATER, INCLUDING THE OPEN SEAS

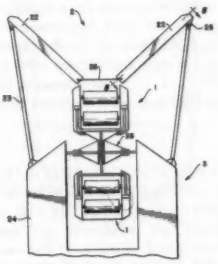
Giuseppe Ayroldi, Via Guido Zanobini, N. 55, Rome, Italy

Filed Mar. 1, 1984, Ser. No. 585,231

Claims priority, application Italy, Mar. 1, 1983, 47828 A/83

Int. Cl.³ E02B *15/04;* C02F *1/40*

U.S. Cl. 210—242.3 5 Claims



1. An apparatus for the recovery of fluid substances or the like floating on water and even in open seas, comprising:

(a) a conveying apparatus adapted to be moved on the water by a support vessel, the conveying apparatus including two flexible floating arms which are more flexible in a vertical plane than in a longitudinal plane, the floating arms being linked to each other in their rear parts by a rod and assuming the shape of a V;

(b) swinging forks for connecting the conveying apparatus to the support vessel, the swinging forks allowing the conveying apparatus and the support vessel to float independently of each other;

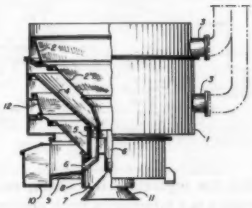
(c) a self-floating recovery unit adapted to be moved on the water by said support vessel, the recovery unit including a rotating horizontal drum for recovery of said floating fluid substances, an apron around the sides and rear of the drum for containing a layer of the floating fluid substances directed towards the drum by the floating arms of the conveying apparatus, and means for removing fluid substances from the drum after being recovered by the drum; and

(d) means for connecting the recovery unit to the support vessel, the means including a swinging fork which allows the recovery unit and the support vessel to float independently of each other, and the means further including a hinge which allows the recovery unit to rotate about its longitudinal axis independently of the support vessel.

4,514,300
DEHYDRATING CENTRIFUGAL SIEVE

Adolf Szczesny; Reiner Kleinert, both of Zabrze; Antoni Jedo, Gliwice, and Zygmunt Gutorski, Katowice, all of Poland, assignors to Centrum Mechanizacji Gornictwa "Komag", Gliwice, Poland

Filed Aug. 9, 1983, Ser. No. 521,564
Claims priority, application Poland, Aug. 16, 1982, 237942
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—342 **2 Claims**

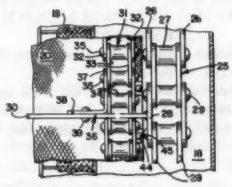


1. A dehydrating centrifugal sieve assembly for separating solid particles from liquids, comprising a housing and at least two generally conical shaped sieves in the form of inverted frustum cones mounted in the housing, disposed one below the other and substantially nested one inside the other, each two adjacent conical sieves being separated from each other by a funnel also of an inverted generally conical shape and nested therebetween, each funnel having a bottom center portion with a circumferential liquid collecting gutter, each conical sieve having an upper circumference and having an input nozzle connected approximately tangentially to said sieve adjacent said upper circumference, a particulate discharge conduit means situated in a central bottom portion of each conical sieve and being arranged vertically and interconnected to a single discharge, a clarified liquid discharge means being situated on a radially outward side near the bottom of the housing, each of said circumferential gutters having passage means vertically situated inside the discharge conduit means, and connected with a collecting chamber for the clarified liquids, said chamber being situated under the lowest conical sieve within the housing and above a flow-off surface on a bottom portion of the housing.

4,514,301
CONTINUOUS MEDIA FILTER

David G. Parshall, Northville, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 24, 1981, Ser. No. 295,651
Int. Cl.³ B01D *33/02*
U.S. Cl. 210—400 **2 Claims**



1. A filter apparatus for removing suspended solids from a liquid suspension, said apparatus comprising

(a) a tank including a base and upstanding end and side walls defining a chamber in which said liquid suspension is received;

(b) a filtrate chamber in said tank;

(c) said filtrate chamber including a perforate wall through which the liquid filtrate flows into said filtrate chamber;

(d) an endless flexible media having laterally spaced and longitudinal extending edges, said filter media being mounted on said tank so that a length thereof overlies said perforate wall and another length is disposed exterior of said tank;

(e) endless conveyor means mounted on said tank and located so as to provide a path of travel similar to the path of said filter media;

(f) said conveyor means including a holddown chain having a run overlying a marginal edge portion adjacent each of said longitudinal edges of said filter media to maintain a first inboard marginal edge portion of said filter media in contact with said perforate wall and a conveyor chain located outboard of a second marginal edge portion outboard of said first marginal edge portion;

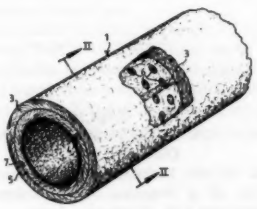
(g) means fixing said outboard second marginal edge portion of said filter media to the outboard face of said holddown chain for movement therewith; and

(h) drive means for driving said conveyor means.

4,514,302
NON-WOVEN TUBE FOR MEMBRANE FILTRATION

Cornelis van Zon, Zwolle; Gerrit J. Jonkeren, and Hilbert Eggengoor, both of Bruchterveld, all of Netherlands, assignors to Wafilin B.V., Zwolle, Netherlands

Filed Dec. 13, 1982, Ser. No. 449,318
Claims priority, application Netherlands, Dec. 14, 1981, 81 05621
Int. Cl.³ B01D *39/14*
U.S. Cl. 210—433.2 **5 Claims**



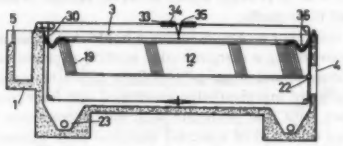
1. A tube of a heat-sealable non-woven material comprising in a longitudinal direction a connecting seal obtained by ultrasonic sealing, said tube being a composite tube (1) and comprising at least an innermost non-woven tube (2) and another outermost non-woven tube (3) surrounding the innermost non-woven tube (2) and each comprising in a longitudinal direction an extending connecting seal, said non-woven tubes being mutually fixed against shifting with respect to each other and wherein the first connecting seal (4) of the innermost non-woven tube and another connecting seal (5) of the other outermost non-woven tube are positioned in a staggered manner with respect to each other, the innermost and the other outermost non-woven tube being locally interconnected by the influence of a heat melting glue, said composite tube being provided with a membrane (8) for membrane filtration, and the seal (5) in the outermost non-woven tube extending partially into the innermost tube by means of a region of interfused non-woven fibers of the innermost non-woven tube, said region not extending into the inner side of the innermost tube.

4,514,303

SLUDGE TRACTION AND DESLUDGING SYSTEM

Richard P. Moore, cor. Black Reef Rd. & Moore St., Germiston, Transvaal Province, South Africa

Filed Jun. 9, 1983, Ser. No. 502,621
Int. Cl.³ B01D *21/24*
U.S. Cl. 210—519 **17 Claims**



7. A settlement tank installation comprising:

(a) means defining a separating chamber having an inlet for liquid to be directed to an elongated horizontal feed area in the chamber;

(b) means defining a collection channel having a top level controlling outlet opening;

(c) an inclined plate assembly in the separating chamber comprising:

(i) a multiplicity of spaced flexible sheet weighted at their lower ends;

(ii) upper means to suspend the sheets from their upper ends; and,

(iii) lower means connected with the lower ends of the sheets such that the lower ends are movable relative to the upper ends to adjust the inclination of the sheets to the desired angle; and,

(d) perforated side wall means disposed between the separating chamber and the collection channel adjacent to the inclined plate assembly, the perforations extending over the greater part of the height of the inclined sheets, and wherein the top level controlling outlet controls the liquid at the top of the flexible sheets.

4,514,304

METHOD FOR PURIFYING AND CONCENTRATING ORGANIC MATTERS

Yoshiyuki Miyaki; Yoshitaka Fujita; Kazunori Se, and Teruo Fujimoto, all of Nagaoka, Japan, assignors to Toyo Soda Manufacturing Ltd., Shinnanyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,625
Claims priority, application Japan, Feb. 9, 1983, 58-18878
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—638 **12 Claims**

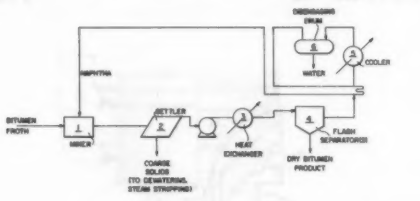
1. In a method for purifying and concentrating organic matters containing inorganic salts, the improvement comprising (a) employing an amphoteric ion-exchange membrane which is made of a ternary block copolymer consisting of a macromolecule poly A^- having cation-exchange group, a macromolecule poly B^+ having an ion-exchange group and a macromolecule poly C having no ion-exchange group, said amphoteric ion-exchange membrane characterized in that it allows sodium chloride to permeate at a concentration not lower than 100% of that in a starting aqueous solution when a pressure of 50 kg/cm^2 is given to a starting aqueous solution of sodium chloride of 0.01 g/dl concentration, and (b) by allowing inorganic salts to selectively permeate from an aqueous solution of the organic compounds containing the inorganic salts through the membrane by applying an increased pressure thereto.

4,514,305

AZEOTROPIC DEHYDRATION PROCESS FOR TREATING BITUMINOUS FROTH

John E. Filby, Calgary, Canada, assignor to Petro-Canada Exploration, Inc., Calgary, Canada

Filed Dec. 1, 1982, Ser. No. 446,029
Int. Cl.³ C10G *33/04*
U.S. Cl. 210—703 **13 Claims**



1. A method for separating the water, coarse solids and bitumen contained in a bituminous froth obtained by admixing water with bituminous sands in order to recover bitumen which comprises: mixing said bituminous froth with a naphtha diluent capable of forming an azeotrope with water; separating part of the coarse solids from the mixture; heating the remaining mixture to a temperature sufficient to cause vaporization of said diluent and the water as an azeotrope; and flashing the heated mixture to substantially separate all water and diluent from the bitumen and remaining solids.

9. A continuous method for separating the water, coarse solids and bitumen contained in a bituminous froth obtained by admixing water with bituminous sands in order to recover bitumen, which comprises: (a) continuously mixing said froth with naphtha diluent capable of forming an azeotrope with water and in an amount only sufficient to remove the water by azeotropism; (b) separating part of the solids and water by decantation; (c) continuously azeotropically dehydrating the resulting mixture of step b, to continuously remove substantially all the water and diluent therefrom, thereby obtaining a substantially dry bitumen and solids product suitable for further upgrade processing; (d) continuously collecting the azeotropic distillate from c, said distillate comprising water and diluent phases and continuously withdrawing the dry bitumen obtained in c; (e) continuously separating the diluent phase from the aqueous phase of the azeotropic distillate collected in d; and (f) continuously recovering said separated diluent for recycling in the process and continously recovering a purified water substantially free of diluent, bitumen and solids.

4,514,306

METHOD OF AND APPARATUS FOR CONTROLLING THE QUANTITY OF FILTER AID FED TO A SEDIMENT FILTER SO AS TO MAINTAIN VIRTUALLY CONSTANT A PRESELECTED OPTIMUM SPECIFIC CAKE RESISTANCE

Carlos M. Pato, Staten Island, N.Y., assignor to Monarch Wine Co., Inc., Brooklyn, N.Y.

Continuation of Ser. No. 449,866, Dec. 15, 1982, abandoned, and a continuation-in-part of Ser. No. 277,890, Jun. 26, 1981, abandoned. This application Mar. 29, 1984, Ser. No. 594,766
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—740 **13 Claims**

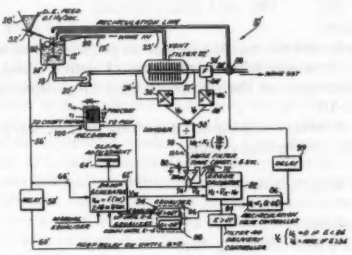
1. In a process comprising the separation of suspended solids from a liquid where the solids are retained by being entrapped in the porous structure of a filtration cake formed by particles of a filter aid material fed to the liquid upstream of the filtration cake, a control method wherein:

(a) the filter aid feed is regulated in successive incremental steps in a manner such that successive incremental layers of cake produced maintain a practical specific cake resis-

tance r* at a pre-selected value even if the concentration of solids suspended in the liquid varies with time,

(i) the specific cake resistance r* being the ratio $\Delta R/\Delta W$ where ΔW is a small increment of filter aid weight fed to build up an incremental layer, and

(ii) a predetermined increase in cake resistance to flow attained upon the addition of an incremental layer of



filter aid feed corresponding to that increment ΔW and which has solids entrapped therein just sufficient to result in the said resistance increase ΔR,

(iii) both increments being expressed on a per unit of filtration area, and

(iv) where the resistance to flow R is the quotient of the differential pressure P across the cake divided by the flow rate per unit of filtration area F.

4,514,307

METHOD OF STABILIZING ORGANIC WASTE

Raymond Chestnut, Ridley Park; John J. Colussi, Norristown; Donald J. Frost, Chalfont; William E. Keen, Jr., Flourtown, and Margaret C. Raduta, Riegelsville, all of Pa., assignors to Conversion Systems, Inc., Horsham, Pa.

Filed Jul. 26, 1983, Ser. No. 517,753

Int. Cl.[3] C02F *11/14*; C04B *1/00*

U.S. Cl. 210—751 **10 Claims**

1. A method of disposing of a physically unstable, water-containing, non-biologic organic waste material, said waste material being comprised of at least 20% by weight on a wet weight basis non-biologic, water insoluble, organic compounds said method consisting essentially of mixing said waste material with cementitious reactants in the presence of water, said cementitious reactants consisting essentially of lime and fly ash, to form a compactible mixture in which the relative proportions of said waste material, lime fly ash, and water are sufficient to permit said lime and fly ash to react at atmospheric conditions to form a cementitious matrix in which the nonaqueous portion of said waste material is encapsulated and permitting said mixture to react under atmospheric conditions to form a relatively impermeable, load-bearing material, wherein said mixture comprises at least 0.5% (by weight on a dry basis) CaO equivalents, and at least 30% (by weight on a wet weight basis) fly ash.

4,514,308

SULFONATED ASPHALT

Richard L. Clampitt, and Jeffrey A. Russell, both c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Jul. 29, 1983, Ser. No. 518,703

Int. Cl.[3] C08L *25/10, 53/02, 95/00*

U.S. Cl. 252—8.5 C **11 Claims**

1. A well working fluid comprising a fluid medium and a sulfonated blend of from about 10:1 to about 5:1 parts by weight of asphalt to parts by weight of a hydrogenated conjugated diene-monovinyl aromatic copolymer substantially free of olefinic unsaturation and wherein said copolymer contains a major proportion of monovinyl aromatic, said sulfonated blend being dispersed in said fluid medium and present in an amount sufficient to reduce the filtration loss of said well working fluid and inhibit shale and clay disintegration.

8. A process for producing a sulfonated asphalt which comprises sulfonating a feedstock blend of from about 10:1 to 5:1 parts by weight of asphalt to parts by weight of a hydrogenated conjugated diene-monovinyl aromatic copolymer containing a major proportion of monovinyl aromatic and which copolymer is substantially free of olefinic unsaturation with a sulfonating agent, neutralizing the resulting sulfonic acids with an alkaline neutralizing agent, separating the resulting sulfonated product, and drying the resulting separated sulfonated asphalt product.

4,514,309

CROSS-LINKING SYSTEM FOR WATER BASED WELL FRACTURING FLUIDS

Suresh K. Wadhwa, Midland, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 27, 1982, Ser. No. 453,051

Int. Cl.[3] C09K *3/00*

U.S. Cl. 252—8.55 R **4 Claims**

1. A water based fracturing fluid, comprising:

water;

a hydratable polymer capable of gelling in the presence of a cross-linking system, said polymer being selected from the group consisting of guars and derivitized guars, locust bean gum, karaya gum, carboxymethyl cellulose, carboxymethylhydroxyethyl cellulose, hydroxyethyl cellulose, and mixtures thereof;

a liquid cross-linking system, said cross-linking system comprising a mixture of organotitanate constituent and a boron constituent in a liquid carrier, said organotitanate constituent comprising a mixture of two titanates, one of said titanates having a lactate base and the other of said titanates having a triethanolamine base, and said boron constituent being selected from the group consisting of alkali metal borates, alkaline earth metal borates, boric acid, and mixtures thereof; and

wherein said hydratable polymer is present in said water based fracturing fluid in the range from about 20 to 50 pounds of hydratable polymer per 1,000 gallons of water used, and said liquid cross-linking system is added in the range of about 0.50 to 2.50 gallons of liquid cross-linking system per 1,000 gallons of water used.

4,514,310

HIGH TEMPERATURE STABLE FLUIDS FOR WELLBORE TREATMENT CONTAINING NON-AQUEOUS SOLVENTS

Israel J. Heilweil, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 413,575, Aug. 31, 1982,. This application Jun. 7, 1983, Ser. No. 502,054

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.[3] E21B *37/00*; C09K *7/06*

U.S. Cl. 252—8.55 R **12 Claims**

1. A method for flushing potentially formation damaging materials from a wellbore prior to perforation, said method comprising flushing said material with a completion fluid, said completion fluid comprising a density increasing salt dissolved in a solvent for said salt, said solvent comprising at least about 50% by weight of N-methyl-2-pyrrolidone, and said salt being present in said fluid in an amount sufficient to increase the density of said fluid in order to balance formation pressure.

4,514,311
WEAR-RESISTANT AIRCRAFT ENGINE LUBRICATING OIL

Rodney Lu-Dai Sung, Fishkill; William M. Sweeney, Wappingers Falls, and Benjamin H. Zoleski, Beacon, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 9, 1983, Ser. No. 492,779
Int. Cl.³ C10M *1/46*
U.S. Cl. 252—32.5 **25 Claims**

1. An aircraft engine lubricating oil composition which comprises

(a) a major portion of a lubricating oil; and

(b) a minor wear-inhibiting amount of, a reaction product of

(i) a polyprimaryamine

$$R(OR'')_a(NH_2)_b$$

wherein

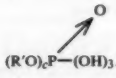
R is a hydrocarbon group;

R'' is a divalent lower alkyl hydrocarbon group;

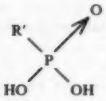
a is an integer 1–6;

b is an integer 2–5; and

(ii) a phosphate ester



wherein R' contains 1–30 carbon atoms and is alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, or aryl, and c is an integer 1–2; or a phosphonic acid



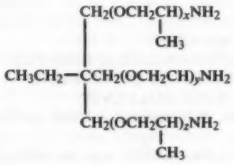
wherein the reaction product is prepared at ambient conditions and wherein the ratio of amine groups to free hydrogen on the phosphate ester or phosphonic acid is 1–3:1.

11. An aircraft engine lubricating oil composition which comprises

(a) a major portion of a lubricating oil; and

(b) a minor wear-inhibiting amount of, a reaction product of

(i) a polyprimaryamine



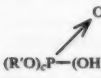
wherein

x is 1–3;

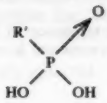
y is 1–3;

z is 1–3; and the sum of x, y, and z is 3–6; and

(ii) a phosphate ester



wherein R' contains 1–30 carbon atoms and is alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, or aryl, and c is an integer 1–2; or a phosphonic acid



wherein the reaction product is prepared at ambient conditions and wherein the ratio of amine groups to free hydrogen on the phosphate ester or phosphonic acid is 1–3:1.

18. A novel composition comprising the reaction product of

(i) a polyprimaryamine

$$R(OR'')_a(NH_2)_b$$

wherein

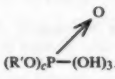
R is a hydrocarbon group;

R'' is a divalent lower alkyl hydrocarbon group;

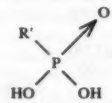
a is an integer 1–6;

b is an integer 2–5; and

(ii) a phosphate ester



wherein R' contains 1–30 carbon atoms and is alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, or aryl, and c is an integer 1–2; or a phosphonic acid



wherein the reaction product is prepared at ambient conditions and wherein the ratio of amine groups to free hydrogen on the phosphate ester or phosphonic acid is 1–3:1.

4,514,312
LUBRICANT COMPOSITIONS COMPRISING A PHOSPHATE ADDITIVE SYSTEM

Jon C. Root, Leawood; John F. Barnes, Olathe, both of Kans., and Jack E. Coovert, Kirkwood, Mo., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 400,728, Jul. 22, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 599,653
Int. Cl.³ C10M *1/46*
U.S. Cl. 252—32.5 **15 Claims**

1. A lubricant composition for use under extreme pressure conditions while being substantially inert with respect to elastomeric substances over a wide temperature range, comprising: a major proportion of a low-sulfur lubricating oil base grease, and a minor proportion of an additive system consisting essentially of a mixture of an oil-soluble, sulfur-free organic phosphate or phosphite and one or more oil-insoluble, sulfur-free inorganic phosphates, said additive system being present in an amount sufficient to impart extreme pressure properties to the lubricant composition, while at the same time being substantially inert with respect to elastomeric substances with which the lubricant composition may come into contact.

4,514,313
HIGH ALKALINITY SULFURIZED ALKYLPHENATES OF ALKALINE EARTH METALS AND METHOD OF MAKING SAME

Jean-Louis Le Coent, Le Havre, France, assignor to Orogil, Courbevoie, France

Filed Jun. 24, 1983, Ser. No. 507,804
Claims priority, application France, Jun. 24, 1982, 82 11060
Int. Cl.³ C10M *1/54*
U.S. Cl. 252—42.7 **26 Claims**

1. A method of preparing high alkalinity sulfurized alkylphenates of alkaline earth metals, comprising the steps of:

(a) neutralizing a sulfurized alkylphenol in a neutralization medium with an alkaline earth base, the quantity of said alkaline earth base being such as to yield an alkaline earth base to alkylphenol molar ratio of from about 0.4/1 to about 3/1, said neutralization being performed in the presence of such quantities of a dilution oil, a glycol, and halide ions, the glycol being present in the form of a mixture with an alcohol having a boiling point above 150° C., so as to yield an alcohol to glycol molar ratio of at least about 0.4/1, an alkaline earth base to glycol molar ratio of from about 2.6/1 to about 8/1, and a molar ratio of halide ions to alkaline earth base of from about 0.01/1 to about 0.15/1;

(b) removing alcohol, glycol, and water from the medium;

(c) removing sediment from the medium;

(d) carbonating the medium, in the presence of halide ions, with a quantity of CO_2 so as to yield a CO_2 to alkaline earth metal molar ratio of from about 0.25/1 to about 0.75/1;

(e) removing alcohol, glycol, and water from the medium; and

(f) removing sediment from the medium.

4,514,314
OIL SOLUBLE ESTER POUR POINT DEPRESSANT ADDITIVE FOR LUBRICANTS

Albert Rossi, Warren, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 269,754, Jun. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 98,626, Nov. 29, 1979, abandoned. This application Dec. 23, 1983, Ser. No. 565,161
Int. Cl.³ C10M *1/28*
U.S. Cl. 252—56 D **3 Claims**

1. A lubricating oil composition comprising a major proportion of a mineral lubricating oil and at least a pour point depressing amount, in the range of about 0.05 to 0.3 weight %, based on the total weight of said composition of a pour depressing copolymer having a number average molecular weight ranging from 1500 to 40,000, wherein said copolymer is a copolymer of C_{14} to C_{18} 1-olefin and maleic anhydride esterified with 1.2 to 2.0 moles of C_{32} to C_{36} 2-alkyl alkanol per molar proportion of maleic anhydride moiety, and wherein said alkyl portion contains 14 or 16 carbon atoms and the alkanol portion contains 18 or 20 carbon atoms.

4,514,315
ALUMINUM CORROSION INHIBITOR COMPRISING ALKYLENE-SILANE GRAFT COPOLYMER

William N. Matulewicz, Montgomery; Paul H. Mohr, Chappaqua, and Paul L. Matlock, Ossining, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1983, Ser. No. 508,179
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—75 **31 Claims**

1. An aluminum corrosion inhibitor composition concentrate comprising:

(a) alcohol or water or mixtures thereof, and

(b) an ethylenically unsaturated alkylene silane monomer grafted onto a polyalkylene oxide polymer comprising the reaction product of said ethylenically unsaturated grafting silane monomer and a base polymer consisting of a poly-(oxyalkylene) compound of the formula:

$$R''((OC_nH_{2n})_zOR')_a$$

wherein R′ is a member selected from the group consisting of a hydrocarbon radical, a hydrogen atom, or an acyl radical and R″ is a member selected from the group consisting of a hydrocarbon radical, a hydrogen atom, an amine-containing radical, or an acyl radical, a is an integer having a value of 1 to about 4, n has a value of 2 to 4 inclusive, z is an integer having a value of from 4 to 2300 inclusive, said grafted polymer having a percent silane graft of up to about 60%, said base polymer having a number average molecular weight of between about 200 and about 100,000, and wherein the amount of component (b) is between greater than about 0.01 wt. % and about 20 wt. % based on the total amount of component (a) plus component (b) in said concentrate.

4,514,316
POLYISOCYANATE COMPOSITIONS USEFUL FOR POLYURETHANE BINDERS

Robert A. Laitar, Woodridge, Ill., assignor to Acme Resin Corporation, Forest Park, Ill.

Continuation-in-part of Ser. No. 508,781, Jun. 29, 1983, Pat. No. 4,436,881. This application Dec. 8, 1983, Ser. No. 559,567
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.³ C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182 **6 Claims**

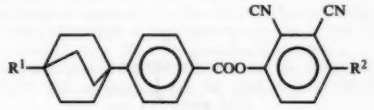
1. A mixture comprising a polyisocyanate component and from about 0.02% to about 3% by weight of the polyisocyanate of one or more organic phosphorous compounds which retard premature uncatalyzed reaction between the polyisocyanate and a polyhydroxy compound wherein the organic phosphorous compounds are selected from the groups: dichloroarylphosphines, chlorodiarylphosphines, arylphosphonic dichlorides and diarylphosphinyl chlorides.

4,514,317
ANISOTROPIC COMPOUNDS AND LIQUID CRYSTAL MIXTURES

Huynh-Ba Tuong, Baden; Stephen M. Kelly, Oberrohrdorf, and Maged A. Osman, Zurich, all of Switzerland, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 460,943
Claims priority, application Switzerland, Feb. 4, 1982, 675/82
Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *121/64*
U.S. Cl. 252—299.62 **4 Claims**

1. An anisotropic compound having a negative DC anistropy and improved photochemical stability of the formula



wherein R^1 and R^2 each are alkyl with in each case 1 to 12 C-atoms in a straight or branched chain, which may be chiral.

4,514,318

STABILIZING POLYSACCHARIDE-THICKENED AQUEOUS MEDIUM AND STABLE AQUEOUS GEL

Philip A. B. Rodriguez, Mont-St.-Hilaire, Canada, assignor to C-I-L Inc., North York, Canada

Filed Feb. 15, 1984, Ser. No. 580,188
Claims priority, application Canada, Apr. 14, 1983, 425914
Int. Cl.³ B01J *13/00;* **C08L** *3/02, 5/00*
U.S. Cl. 252—315.3 **5 Claims**

1. A method of stabilizing a polysaccharide-thickened aqueous medium which comprises adding to a polysaccharide/water mixture from 0.01% to 1% by weight of the total composition of a water-insoluble, oxidizable, sulphur-containing compound selected from the group consisting of tetrabutyl thiuram disulphide, tetraethyl thiuram disulphide, tetramethyl thiuram disulphide, dithiomorpholine and tetramethyl thiuram monosulphide.

4. A stable aqueous gel comprising a mixture of water and a polysaccharide thickener and from 0.01% to 1% by weight of the total composition of a stabilizer comprising a water-insoluble, oxidizable, sulphur-containing compound selected from the group consisting of tetrabutyl thiuram disulphide, tetraethyl thiuram disulphide, tetramethyl thiuram disulphide, dithiomorpholine and tetramethyl thiuram monosulphide.

4,514,319

ANTIFOAM COMPOSITION CONTAINING HYDROCARBON-SILICON COPOLYMER, HYDROPHOBIC FILLER AND HYDROCARBON OIL

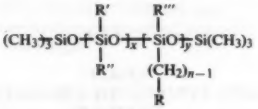
Ravi D. Kulkarni, Milpitas, Calif.; E. Desmond Goddard, Haworth, N.J., and Michael P. Aronson, Valley Cottage, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 25, 1983, Ser. No. 478,718
Int. Cl.³ B01D *19/04*
U.S. Cl. 252—321 **19 Claims**

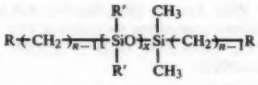
1. A novel hydrocarbon oil based silicone antifoam composition comprising:

(a) from 1 to 60 weight percent of a hydrocarbon-silicon copolymer with a percent CH_2 content in the range of from 30% to 70% inclusive, which hydrocarbon-silicon copolymer is soluble in a hydrocarbon carrier oil and is selected from the group consisting of

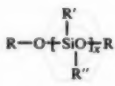
(1) random or block copolymers of the general formula:



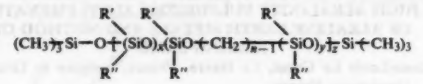
(2) non-hydrolyzable ABA block copolymers of the general formula:



(3) hydrolyzable ABA block copolymers of the general formula:

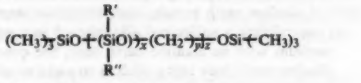


(4) non-hydrolyzable AB_z block copolymers of the general formula:



and

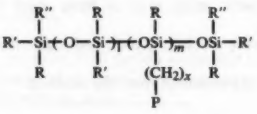
(5) hydrolyzable AB_z block copolymers of the general formula:



wherein R is an alkyl, aryl, aralkyl or alkaryl group containing from six to thirty carbon atoms, R', R'' and R''' are individually selected from the group consisting of hydrogen or methyl, ethyl, propyl, hydroxy, and phenyl groups provided that no more than 5% of the total R', R'' and R''' groups are hydrogen hydroxy, phenyl or a combination thereof, and x,y,z and n are such a value so that the overall % CH_2 content is in the range of from 30% and 70%

(b) from 1 to 20 weight percent of an hydrophobic filler having a particle size on the average of 200 to 5,000 A;

(c) from 0 to 25 weight percent of a organo-silicone surfactant of the general formula:



wherein R, R' and R'' are individually alkyl groups having from 1 to 18 carbon atoms inclusive, or hydrogen, hydroxy or phenyl groups provided that no more than 5% of the total R, R' and R'' groups are hydrogen, hydroxy, phenyl or a combination thereof. P is either a polyoxyethylene group, a polyoxypropylene group, a polyoxybutylene group or a mixture thereof which can be terminated with either an alkyl or hydroxyl group, l and m are such that the surfactant is liquid, has limited solubility and an HLB of from 4–14; and x has a value of from 2 to 5

(d) from 20 to 98 weight percent of a hydrocarbon carrier oil; and

(e) optionally from 0 to 20 weight percent of a silicone oil.

4,514,320

HALIDE FREE CORROSION INHIBITORS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis

Division of Ser. No. 200,817, Oct. 27, 1980,. This application Mar. 12, 1984, Ser. No. 588,593
Int. Cl.³ C23F *11/14*
U.S. Cl. 252—392 **4 Claims**

1. A corrosion inhibiting composition comprising non-halogen salts of alkylpyridines and N-alkyldihydropyridines, said composition also containing an effectiveness enhancing amount of an oxyalkylate surfactant.

4,514,321

THICK FILM CONDUCTOR COMPOSITIONS

Vincent P. Siuta, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1983, Ser. No. 526,400
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—512 **9 Claims**

1. A copper-containing thick film conductor composition comprising a mixture of finely divided particles of:

(a) 85–98.8% wt. conductive material consisting essentially of 28–100% wt. copper and 72–0% wt. noble metal;
(b) 10–1% wt. inorganic binder having a softening point below 800° C.; and
(c) 5–0.2% wt. of a noncuprous material selected from the group consisting of tungsten, molybdenum, rhenium and alloys and mixtures thereof

dispersed in organic medium, the composition being further characterized in that

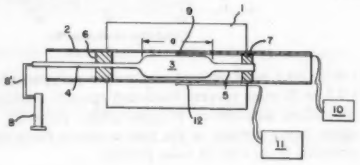
(1) the copper particles have a maximum size below 10 μm and an average size of 2–4 μm; and
(2) the noncuprous metal particles have a maximum size below 5 μm and an average size of 0.2–3 μm.

4,514,322

PHOSPHOROUS-DOPED TIN OXIDE POWDER

Thomas J. Swoboda, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 19, 1984, Ser. No. 602,000
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—518 **7 Claims**



1. Process for preparing a powder of phosphorus-doped tin oxide comprising the steps

(a) combining dehydrated metastannic acid with red phosphorus in proportions to provide from about 1 to 4 atom % phosphorus in the doped tin oxide and sand milling the composition in an azeotropic liquid comprising methanol in trichlorotrifluoroethane,
(b) evaporating the azeotropic liquid from the product obtained in (a),
(c) separating the milled phosphorus and tin oxide mixture from the sand, and
(d) heating the mixture of phosphorus and tin oxide in an inert gas at a temperature within the range of 450° C. to 700° C. and for a time sufficient to obtain a phosphorus-doped tin oxide powder having a conductivity of at least 0.1 $ohm^{-1}cm^{-1}$ at a density of 3.48 g/cm^3.

4. Phosphorus-doped tin oxide powder exhibiting a conductivity of at least 0.1 $ohm^{-1}cm^{-1}$ at a density of 3.48 g/cm^3, said powder having a particle size within the range of 0.02 to 1.5 microns and containing from about 1 to 4 atom % phosphorus.

7. A conductive composition comprising the powder of claim 4 dispersed in a thermoplastic synthetic polymer in an amount of about 65 to 75% by weight of the composition.

4,514,323

UTILIZATION OF 2-HYDROXY-3,4,4-TRIMETHYL-CYCLOPENT-2-EN-1-ONE AS PERFUMING INGREDIENT

Sina D. Escher, Le Lignon, and Anthony F. Morris, Gingins, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Nov. 1, 1982, Ser. No. 438,315
Claims priority, application Switzerland, Nov. 27, 1981, 7596/81
Int. Cl.³ C11B *9/00*; D06M *13/12*; C11D *3/50*
U.S. Cl. 252—522 R **3 Claims**

1. Process to confer to or improve or modify the odorous properties of perfumes and perfumed articles which comprises adding thereto a fragrance effective amount of 2-hydroxy-3,4,4-trimethyl-cyclopent-2-en-1-one to impart a warm and spicy odorous note thereto.

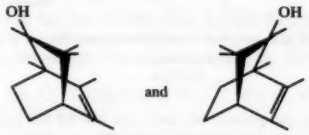
4,514,324

1,2,3,3,5,6-HEXAMETHYL-BICYCLO[2.2.2]OCT-5-EN-2-OL, AND ORGANOLEPTIC USES OF SAME

William J. Evers, Locust; Braja D. Mookherjee, Holmdel; Anton Van Ouwerkerk, Livingston, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 535,800, Sep. 26, 1983, Pat. No. 4,471,135, which is a division of Ser. No. 371,930, Apr. 26, 1982, Pat. No. 4,434,085. This application Apr. 20, 1984, Ser. No. 602,569
Int. Cl.³ A61K *7/46*; C11B *9/09*
U.S. Cl. 252—522 R **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfumed article comprising the step of adding to said perfumed polymer, an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group consisting of:



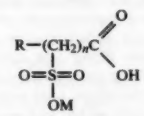
4,514,325

AQUEOUS METAL TREATING COMPOSITIONS AND METHOD OF USE

Anthony Russo, Grand Rapids, and Thomas Mauthner, Livonia, both of Mich., assignors to J. Hall Company, Grand Rapids, Mich.

Filed Apr. 13, 1984, Ser. No. 600,165
Int. Cl.³ C11D *1/28*
U.S. Cl. 252—557 **15 Claims**

1. A storage stable water based metal cleaning and degreasing composition comprising water, about 5 to about 20% by weight of water insoluble lipophilic organic solvent and a coupling agent comprising a compound having the formula



I

where R—$(CH_2)_n$ is the residue of a sulfonated monounsaturated C_{12} to C_{18} fatty acid having the C—S attachment in one of the carbon atoms of the residue and M is an alkali metal, alkaline earth metal or amine, the weight ratio of solvent to coupling agent being from about 1:1 to 2:1.

4,514,326

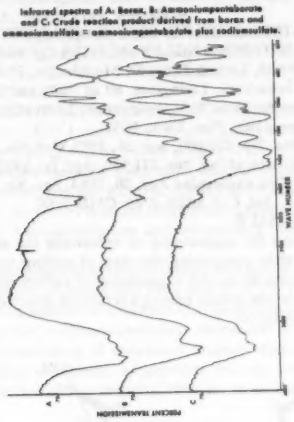
PERMANENT FLAME RETARDANT AND ANTI-SMOLDERING COMPOSITIONS

Stephen I. Sallay, 2918 Glencairn Dr., Fort Wayne, Ind. 46815

Continuation-in-part of Ser. No. 489,176, Apr. 27, 1983, which is a continuation-in-part of Ser. No. 286,042, Jun. 22, 1981, Pat. No. 4,382,025, which is a continuation-in-part of Ser. No. 135,177, Mar. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,340, Jul. 24, 1978, Pat. No. 4,196,177. This application Apr. 24, 1984, Ser. No. 603,340
Int. Cl.³ C09K *3/28*
U.S. Cl. 252—602 **20 Claims**

1. A solid composition having flame retardant, antismoldering and noncorrosive properties comprising as a first compo-

nent, ammoniumpentaborate, and as a second component an alkali and/or alkaline earth metal sulfate, sulfite, hydrophosphate or mixtures thereof wherein the molecular ratios of the


Infrared spectra of A: Borax, B: Ammoniumpentaborate and C: Crude reaction product derived from borax and ammoniumsulfate + ammoniumpentaborate plus sodiumsulfate.
WAVE NUMBER

respective two components are between 0.4–0.8 for ammoniumpentaborate and 0.5–1.0 mole equivalent amounts for the alkali and/or alkaline earth metal salt(s).

4,514,327

FIRE RETARDANT MEANS AND METHOD

James E. Rock, 412 E. Lorengo Ave., Norfolk, Va. 23503

Filed Jan. 10, 1983, Ser. No. 456,706

Int. Cl.³ C09K *7/00*

U.S. Cl. 252—607 **17 Claims**

1. A fire retardant composition formed from the following ingredients: ammonium sulfate; borax; boric acid; and monoammonium phosphate whereby a fire retardant compound is formed which has fire retardant properties and smoke inhibiting factors which are greater than sum of the individual ingredients.

8. The method of applying a fire retardant to fiberous products comprising: placing such products within a sealed enclosure; drawing a vacuum of approximately 28 inches of mercury within said enclosure for approximately 10 minutes while maintaining said vacuum; filling said enclosure with a fire retardant solution including ammonium sulfate, borax, boric acid, monoammonium phosphate, until said products are submerged, creating a pressure within said enclosure of between 45 and 100 psi; maintaining such pressure from 10 to 60 minutes; draining the solution from the enclosure; and redrawing a vacuum of approximately 28 inches of mercury within said enclosure for a period of approximately 10 inches whereby superior fire retardant properties can be given to said fiberous products.

4,514,328

PARTICULATE MATERIAL REDUCING THE IGNITABILITY OF COMBUSTIBLE SUBSTANCES

Horst Staendeke, Lohmar; Franz-Josef Dany, and Joachim Kandler, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,291

Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217816

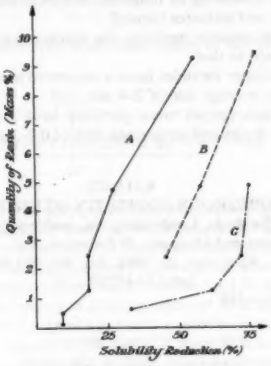
Int. Cl.³ C08K *3/28, 3/32*

U.S. Cl. 252—609 **6 Claims**

6. Particulate agent for flameproofing polyurethanes or polyurethane foam plastics based on a free-flowing, pulverulent ammonium polyphosphate of the general formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

in which n stands for a whole number with an average value of 20 to 800 and the ratio of m/n is about 1, and an epoxide resin with an epoxide equivalent weight of 170 to 220, the agent containing:



(a) 80 to 99.5 mass percent ammonium polyphosphate, and

(b) 0.5 to 20 mass percent hardened epoxide enveloping the individual ammonium polyphosphate particles, and the agent being present in the polyurethane foam plastics in amounts from 5 to 25 mass percent.

4,514,329

PROCESS FOR VITRIFYING LIQUID RADIOACTIVE WASTE

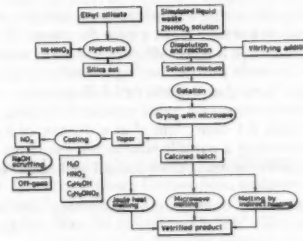
Hajimu Wakabayashi, Kawanishi; Ryohei Terai, Ibaraki; Hiroshi Yamanaka, Ikeda, and Shigeo Hara, Osaka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,748

Claims priority, application Japan, Jul. 6, 1981, 56-106047

Int. Cl.³ G21F *9/16, 9/14*

U.S. Cl. 252—629 **3 Claims**



1. A process for vitrifying liquid radioactive waste, comprising the steps of:

dissolving at least one water-soluble vitrifying-facilitating inorganic compound selected from the group consisting of boric acid, aluminum hydroxide, lithium nitrate, lithium carbonate, lithium sulfate, magnesium nitrate, magnesium carbonate, magnesium sulfate, calcium nitrate, calcium carbonate, barium nitrate, aluminum nitrate, zinc nitrate, zinc sulfate, zirconium oxynitrate and a hydrate thereof, into a liquid radioactive waste acidified with nitric acid

adding to the resulting solution an alcoholic silica sol obtainable through hydrolysis with an acid of at least about 1 part by weight of alkyl silicate to 1 part by weight of the at least one inorganic compound, based on the weight of the oxide, and allowing the resulting solution mixture to gel at a temperature of from room temperature to 50? C.,

calcining the resulting gel by microwave radiation, and heating the resulting calcined product to melt, followed by cooling to obtain a vitrified product.

4,514,330

CARBON-7-SUBSTITUTED ATINOMYCIN D ANALOGUE

Sisir K. Sengupta, Needham, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Jun. 28, 1983, Ser. No. 508,689

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **2 Claims**

1. The compound 7-(2,3-epoxypropoxy)actinomycin.

4,514,331

PEPTIDE HORMONES WITH CALCITONIN-LIKE ACTIVITY

Emil T. Kaiser, and Gregory Moe, both of New York, N.Y., assignors to University Patents, Inc., Westport, Conn.

Filed Jun. 29, 1983, Ser. No. 509,123

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 T **2 Claims**

1. The compound of the formula:

$$H_2N\text{—Cys—Gly—Asn—Leu—Ser—Thr—Cys—Leu—Leu—}$$

$$\text{—Gln—Gln—Trp—Gln—Lys—Leu—Leu—Gln—Lys—Leu—}$$

$$\text{—Lys—Gln—Leu—Pro—Arg—Thr—Asn—Thr—Gly—Ser—}$$

$$\text{—Gly—Thr—Pro}\overset{\overset{O}{\|}}{C}NH_2$$

and the pharmaceutically acceptable salts thereof.

4,514,332

TETRAPEPTIDE ADAMANTYL AMIDES

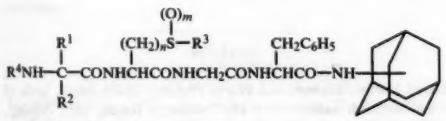
Donald W. Hansen, Jr., Chicago; John S. Baran, Winnetka, and William H. Owens, Arlington Heights, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 16, 1984, Ser. No. 600,650

Int. Cl.³ C07C *103/52*

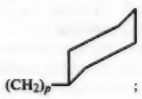
U.S. Cl. 260—112.5 E **23 Claims**

1. A compound of the formula:



wherein R^1 is:

(a)



;

or

(b) straight or branched chain alkyl of 1 to 6 carbon atoms, inclusive;

wherein R^2 is:

(a) hydrogen; or

(b) alkyl of 1 to 3 carbon atoms, inclusive;

wherein R^3 is:

(a) $CH_2C_6H_5$; or

(b) alkyl of 1 to 3 carbon atoms, inclusive.

wherein R^4 is:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive;

wherein m is 0, 1, or 2;

wherein n is 1 or 2;

wherein p is 0, 1, or 2;

and the stereochemical configuration of each of the optically active amino acid residues may independently be D, L or DL; and the pharmaceutically acceptable salts thereof.

4,514,333

INTERMEDIATES FOR PROCESS FOR 1-OXACEPHEM DERIVATIVES

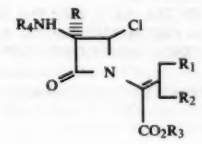
Saul Wolfe, Kingston, and Chia-Cheng Shaw, Montreal, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Division of Ser. No. 356,236, Mar. 8, 1982, Pat. No. 4,391,975, which is a continuation-in-part of Ser. No. 330,838, Dec. 15, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,549

Int. Cl.³ C07D *205/08, 403/12, 403/14, 403/04*

U.S. Cl. 260—239 A **4 Claims**

1. 2-Azetidinyl-3-methyl-2-butenoates of the formula



1

in which

R is hydrogen or methoxy,

R_1 is a hydroxyl group,

R_2 is chlorine, bromine, $OCOCH_3$, or SHET,

R_3 is hydrogen or a group selected from loweralkyl, benzyl, benzyhydryl, loweralkoxy-loweralkyl, loweralkoxybenzyl, phenacyl, trimethylsilyl, 2,2,2-trichloroethyl or pivaloyl,

R_4 is hydrogen or a cleavable acyl group, or R_4NH represents phthalimido, and

HET is a five membered unsaturated heterocyclic ring containing two double bonds with 1–4 hetero atoms, which are the same or different and comprise O, S or N, and optionally substituted with loweralkyl, di-lower alkylamino, mono-lower alkylamino, formylamino, alkanoylamino of 2 to 5 carbons, halogen, amino, cycloalkyl containing 3–7 carbon atoms or lower alkoxy.

4,514,334

POLYPHENOLIC COMPOUNDS

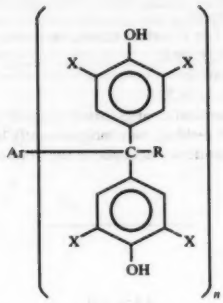
Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 44,039, May 31, 1979, Pat. No. 4,426,513. This application Oct. 17, 1983, Ser. No. 542,528

Int. Cl.³ C09B *11/06, 11/04*; C07C *15/16, 15/12*

U.S. Cl. 260—395 **6 Claims**

1. A polyphenolic compound of the formula



wherein Ar is a mono, -di- or trinuclear aromatic C_{6-14} hydrocarbon radical; R is hydrogen or a C_1–C_5 alkyl radical; each X substituent is independently selected from H, Cl, Br, C_1–C_5 alkyl and phenyl; and n is either 2, 3 or 4.

4,514,335

C_{21}-DICARBOXYLIC ACID ISETHIONATES AS PRIMARY ANIONIC SURFACTANTS

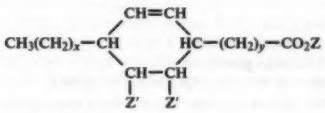
Richard B. Du Vernet, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 395,252, Jul. 6, 1982, Pat. No. 4,476,055. This application Sep. 16, 1983, Ser. No. 532,698

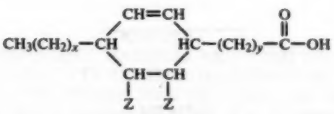
Int. Cl.³ C07C *143/90*; C11D *1/28*

U.S. Cl. 260—400 **9 Claims**

1. A process for preparing hemi-isethionates of the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, Z is selected from the group consisting of hydrogen and $CH_2CH_2SO_3M$, one Z′ is hydrogen and the remaining Z′ is COOH when Z is $CH_2CH_2SO_3M$, and $CO_2CH_2CH_2SO_3M$ when Z is hydrogen, where M is selected from the group consisting of alkali metal cation, alkaline earth metal cation and ammonium cation , which comprises reacting, in an inert environment, a hydroxyethane sulfonate selected from the group consisting of alkali metal, alkaline earth metal and ammonium 2-hydroxyethane sulfonate with C_{21}-dicarboxylic acid of the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, one Z is hydrogen and the remaining Z is COOH, at a temperature between 180° C. to 260° C. for from 1 to 10 hours in an acid:alcohol equivalent ratio of from 1.2 to 2.0 in the presence of a catalytic amount of a member of the group consisting of phosphoric acid, p-toluene sulfonic acid and zinc oxide.

4,514,336

HOMOLOGOUS CARBOXYLIC ACIDS PRODUCTION

Robert C. Ryan, Houston, and Lynn H. Slaugh, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 28, 1982, Ser. No. 382,988

Int. Cl.³ C07C *51/12, 53/08, 53/122, 53/124*

U.S. Cl. 260—413 **2 Claims**

1. A process for homologating as feed a reactant aliphatic alcohol having a carbon number from 1 to about 20 to a series of homologous aliphatic carboxylic acids having one or more carbon atoms than the reactant alcohol which comprises contacting the reactant alcohol with hydrogen and carbon monoxide at a temperature ranging from about 150° C. to about 250° C. and a pressure ranging from about 2,000 psi to about 10,000 psi in the presence of a homogeneous catalyst comprising a catalytically effective amount of ruthenium and rhodium and an iodide promoter and a titanium(IV) promoter, wherein the molar ratio of ruthenium to rhodium ranges from about 2:1 to about 4:1, the molar ratio of iodide to ruthenium plus rhodium ranges from about 6:1 to about 20:1, and the molar ratio of titanium(IV) promoter to ruthenium plus rhodium ranges from about 1.5:1 to about 2.5:1 and the titanium(IV) promoter is selected from titanium(IV) C_1–C_6 alkoxides.

4,514,337

GROUP IVA METAL HYDRIDE CATALYSTS AND PREPARATION THEREOF

Guido P. Pez, Boonton, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 303,261, Sep. 17, 1981, Pat. No. 4,409,411. This application Jun. 30, 1983, Ser. No. 509,528

Int. Cl.³ C07F *7/00, 7/28*

U.S. Cl. 260—429.3 **8 Claims**

1. A method of producing a solid carbonaceous group IVa metal hydride which comprises reacting a group IVa metal halide with a hydrocarbon solution of an alkyllithium or aryllithium at a temperature between about 0° and about 120° C., recovering the solid carbonaceous product, and reacting the solid carbonaceous product with hydrogen to produce the solid carbonaceous group IVa metal hydride.

4,514,338

PANTHENOL DERIVATIVES

Alfred Hanck, Riehen, and Horst Pauling, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 26, 1983, Ser. No. 461,093

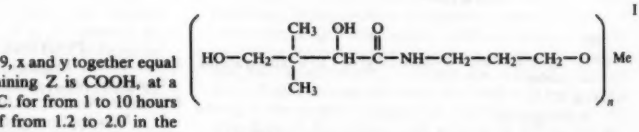
Claims priority, application Switzerland, Feb. 12, 1982, 890/82

Int. Cl.³ C07F *5/06*

U.S. Cl. 260—429.9 **5 Claims**

1. A compound of the formula

D or DL



I

wherein

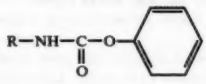
Me is aluminium and n is the integer 3 or Me is zinc and n is the integer 2.

4,514,339
PROCESS FOR PREPARING ALKYL ISOCYANATES

Ugo Romano, Vimercate; Franco Rivetti, Schio, and Giacomo Sasselli, S. Donato Milanese, all of Italy, assignors to Enichimica S.p.A., Milan, Italy

Filed May 10, 1984, Ser. No. 608,984
Claims priority, application Italy, May 13, 1983, 21081 A/83
Int. Cl.³ C07C *69/00*
U.S. Cl. 260—453 P 5 Claims

1. Process for the preparation of alkyl isocyanate which can be defined by the general formula R—N=C=O, wherein R is an alkyl radical having from 1 to 4 carbon atoms, by thermal decomposition of phenyl-N-alkyl urethans which can be defined by the general formula:



wherein R has the above defined meaning, characterized in that said thermal decomposition is carried out without using any substance having a catalytic action upon the decomposition reaction, by heating to a temperature of from 180° C. to 210° C. and under the atmospherical pressure or a slightly reduced pressure, a mixture of phenol and phenyl-N-alkyl urethan, in a molar ratio of the former to the latter equal to, or about equal to 1:1, removing by vaporization the phenol and the alkyl isocyanate as they are being formed, recovering the alkyl isocyanate from said vaporized products and maintaining in the reaction mixture, substantially during the entire thermal decomposition reaction time, a molar ratio of phenol to phenyl-N-alkyl urethan not lower than 1:1.

4,514,340
CYANO-POLYCARBOXYLATES

Jacob S. Tou, and Alfred A. Schleppnik, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 413,009, Apr. 30, 1982, Pat. No. 4,442,298.
This application Sep. 12, 1983, Ser. No. 531,104
Int. Cl.³ C07C *121/66*
U.S. Cl. 260—465 D 2 Claims

1. Pentamethyl 6-cyano-7-phenyloctane-1,2,2,5,6-pentacarboxylate.

2. Tetramethyl 2,6-dicyano-7-phenyloctane-1,2,5,6-tetracarboxylate.

4,514,341
STORAGE STABLE NITROGLYCERIN

H. William Voigt, Wharton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 601,878
Int. Cl.³ C07C *77/02*
U.S. Cl. 260—467 4 Claims

1. In an improved nitroglycerin fluid which is stable for large bulk storage, the improvement consisting essentially of the incorporation in said nitroglycerin of a soluble liquid inert epoxy plasticizer selected from the group consisting of:

A. The condensation product of epichlorohydrin and bisphenol A,

B. Pentaerythritol tetraepoxy stearate,

C. Epoxidized soybean oil,

D. Glyceryl triepoxy acetoxy stearate,

E. Epoxidized linseed oil,

F. Butyl ester of epoxidized linseed oil, and

G. Epoxidized octyl tallate

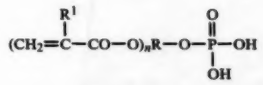
said liquid plasticizer is present in an amount between about 0.24 and about 5.0 percent by weight.

4,514,342
POLYETHYLENICALLY UNSATURATED MONOPHOSPHATES

Richard W. Billington, London; Gordon B. Blackwell, Surrey, and Terence E. Prodger, Sussex, all of England, assignors to Dentsply Limited, Surrey, England

Filed Feb. 7, 1983, Ser. No. 464,778
Claims priority, application United Kingdom, Feb. 16, 1982, 8204511
Int. Cl.³ C07F *9/113;* A01K *6/02*
U.S. Cl. 260—952 6 Claims

1. Polyethylenically unsaturated monophosphates of the formula:



and salts thereof, in which:

R is a pentaerythritol radical having a valency of n+1 and containing from 4 to 16 carbon atoms;

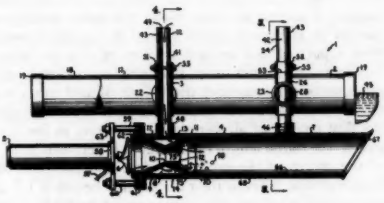
R^1 is a hydrogen atom, alkyl C_1–C_3, halogen or CN radical, and

n is an integer of at least 3.

4,514,343
ASPIRATING HORIZONTAL MIXER

Barry G. Cramer, and Roy A. Cramer, both of Kansas City, Mo., assignors to Air-O-Lator Corporation, Kansas City, Mo.

Filed Sep. 29, 1982, Ser. No. 428,098
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—37 5 Claims



1. An aeration and liquid mixing apparatus comprising:

(a) flotation means;

(b) a selectively tiltable support means adjustably connected to said flotation means and having a lower end extending downwardly therefrom for positioning at various selected heights;

(c) an air delivery conduit;

(d) a mixer unit mounted to said lower end, supported by said support means, and selectively adjustable in height and tilt therewith; said mixer unit including a submersible motor powering a propeller and a nozzle member situated in the flow path of liquid from said propeller;

(e) said nozzle member having wall means with an internal surface extending longitudinally therethrough and venturi means for mixing air from said air delivery conduit with liquid flowing therethrough;

(f) said venturi means including a converging wall formation forming a constriction; and

(g) means forming an air injection port positioned adjacent said constriction for mixing air with said liquid.

4,514,344
APPARATUS FOR THE MIXING OF DIFFERENT STREAMS OF AIR IN A COOLING TOWER

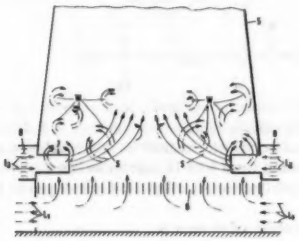
Hans Ruscheweyh, Aachen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Continuation of Ser. No. 533,625, Sep. 19, 1983, abandoned, which is a continuation of Ser. No. 158,174, Jun. 10, 1980, abandoned. This application Jun. 13, 1984, Ser. No. 619,697

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925462

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—159 **6 Claims**



1. In a wet-dry cooling tower having trickle inserts in the inside of the cooling tower for the direct cooling of water charged onto said trickle inserts by a first stream of wet air vertically ascending within the cooling tower, the improvement comprising

heat exchange elements for the indirect cooling of water flowing in the heat flowing in the heat exchange elements by second streams of dry air which are heated by indirect heat exchange in the heat exchange elements,

means for feeding said second streams adjacent to and above the trickle inserts to the first stream of wet air in the inside of the cooling tower, said means including cylindrical air inlet tubes extending from the periphery of said cooling tower and located above the trickle inserts and radially aligned in a cross sectional plane, the latter being perpendicular to the longitudinal axis of the cooling tower, at least a part of said second streams of dry air being fed through said air inlet tubes, said tubes each have a uniform cross section throughout the length of said tubes and an effective eddy-current generating surface with respect to the first stream of air vertically ascending in the cooling tower, the radial length of said tubes is between 20 to 40% of the radius of the cooling tower, and the ratio of the length of said tubes to their diameter is between 1.5 and 4,

a separate fan is operatively flow communicatingly arranged in each of said tubes, respectively,

said air inlet tubes in cooperation with said fans with said at least a part of said second streams form air jets emerging from said air inlet tubes effectively extending the effective eddy-current generating surface of the latter, the tubes as well as said air jets being distributed uniformly over the circumference of the cooling tower and being perpendicularly directed towards the longitudinal axis of the cooling tower such that

said air inlet tubes and said air jets both form the effective eddy-current generating surfaces transversely crossing the vertically ascending first stream of air, such that said effective eddy-current generating surfaces are acted on transversely by the first stream of air vertically ascending in the cooling tower and produce effectively across the entire radius of the cooling tower along which radius a corresponding of said tubes extends a separation of the flow of said first stream on opposite sides of said effective eddy-current generating surfaces of said air inlet tubes and said air jets, forming eddy current fields having components which extend transversely to the vertically ascending first stream, with the eddy current fields developed from said effective eddy-current generating surfaces having axes substantially parallel to the longitudinal axes of the corresponding air inlet tubes, respectively, causing an intensive mixing of said second streams of dry air with said first stream of wet air so as to make the moisture content of the streams uniform by said mixing.

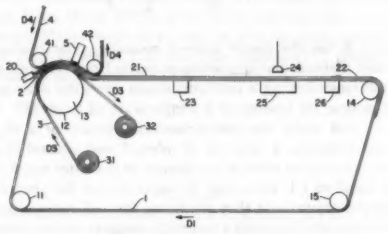
4,514,345
METHOD OF MAKING A FORAMINOUS MEMBER

Bruce A. Johnson, and Andrew J. Wnuk, both of Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 23, 1983, Ser. No. 525,591

Int. Cl.³ B29D *7/20*

U.S. Cl. 264—22 **15 Claims**



1. A continuous method of making a foraminous member the gross foramina of which define a preselected pattern, said method comprising the steps of

(a) Applying a backing film to the working surface of a forming unit;

(b) Juxtaposing a foraminous element to said backing film so that said backing film is interposed said foraminous element and said forming unit;

(c) Applying a coating of liquid photosensitive resin to the surfaces of said foraminous element;

(d) Controlling the thickness of said coating to a preselected value;

(e) Juxtaposing a mask in contacting relation with said coating of said liquid photosensitive resin, said mask comprising opaque and transparent regions, said opaque regions defining therein said preselected pattern;

(f) Exposing said coating of said liquid photosensitive resin to light having an activating wavelength through said mask thereby inducing curing of said liquid photosensitive resin in those regions thereof in register with said transparent regions; and

(g) Removing from said foraminous element substantially all uncured liquid photosensitive resin.

4,514,346
METHOD OF MAKING THERMAL-SHOCK RESISTANT MOLDED ARTICLES ON THE BASIS OF SILICON CARBIDE

Hartmut Luhleich, Düren, and Francisco J. Dias, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft Mit Beschrankter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 233,475, Feb. 11, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 418,679

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005587

Int. Cl.³ C04B *35/34*

U.S. Cl. 264—29.5 **11 Claims**

1. A process for the production of homogeneous and uniformly and throughgoingly porous molded articles or parts,

utilizing carbonaceous particles selected from the group consisting of ground coke, natural graphite, electrographite, charcoal, and carbon black, as a starting material in the form of powder or granules, and including the steps of coating particles of said powder or granular material wih an organic binder, molding a mass of the coated particle to form a "green" molded body, and coking said body up to a maximal temperature in the range from 800° to 1,000° C., said process comprising the improvement which consists in that:

the powdery or granular starting material is a mixture consisting essentially of particles of silicon and said carbonaceous particles in a predetermined mixture proportion and containing substantially no silicon carbide particles;

the coating of the particles with a binder is performed the binder is precipitated by introducing the suspension into a liquid serving to precipitate the binder on the particles as an even coating;

after the coking step, the molded body is heated up, to convert silicon and carbon into silicon carbide, to a temperature in the range from 1,400° C. to 1,600° C., in an inert gas atmosphere at a pressure not less than about 1 bar, said heating up, at least in the temperature range around and above 1,400° C., being at a rapid rate, in order to mitigate the evaporation of silicon.

4,514,347

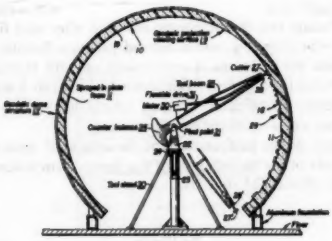
SPHERICAL PROJECTION-TYPE SCREEN FOR USE IN A VEHICLE SIMULATOR

John T. Reed, New Milford, Pa., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 21, 1982, Ser. No. 451,985

Int. Cl.[3] **E04B** *1/16, 1/32;* **B29D** *27/04;* **B29C** *17/12*

U.S. Cl. 264—32 **10 Claims**



1. A method of manufacturing a geodesic dome for use as a spherical, projection-type viewing surface in a vehicle simulator to present to an observer a maximum of realism which matches substantially real world conditions, comprising:

erecting a geodetic generally dome-shaped structure with an inner surface;

applying a coating of predetermined thickness of synthetic material to said inner surface;

smoothing the inner portion of said coating of synthetic material to form a substantially smooth mathematically-derived surface, so that the inner portion forming said surface provides a one-piece, seamless screen for viewing a scene in said vehicle simulator; and

setting up a tool stand with a pivot point to locate the predetermined center of curvature of the geodesic dome, so that all of said step of smoothing the inner portion of said coating of synthetic material is performed about such pivot point to achieve said maximum of realism.

4,514,348

METHOD AND APPARATUS FOR ADJUSTING DIE CLEARANCE

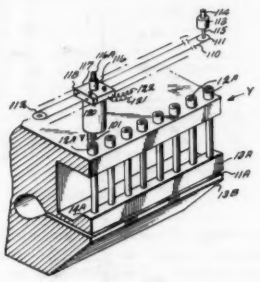
Katsuhiko Iguchi, Susono; Hidemi Wada, Namazu, and Ryuichi Wakita, Mishima, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,836

Claims priority, application Japan, Nov. 15, 1981, 56-177443

Int. Cl.[3] **B29F** *3/04*

U.S. Cl. 264—40.1 **11 Claims**



1. An apparatus for adjusting die clearance between an upper die and a lower die of an extruder for producing a sheet with a plurality of adjusting bolts extending between said upper and lower dies at separated locations across the width of said sheet for adjusting the clearance comprising:

means for measuring the thickness of said sheet at said separated locations after said sheet has emerged from said extruder and producing a signal for each location indicating the measured thickness;

means for calculating for each bolt from the signal of the associated location a desired bolt displacement δB and producing a rough bolt displacement $\delta B(R)$ and a fine bolt displacement of $\delta B(F)$ such that $\delta B = \delta B(R) + \delta B(F)$;

means mounted adjacent said bolts for receiving said rough bolt displacement signals $\delta B(R)$ and mechanically tightening or loosening each bolt in accordance with the associated $\delta B(R)$ signal; and

means adjacent each said bolt for receiving said fine bolt displacement signal $\delta B(F)$ associated with the adjacent bolt and heating the adjacent bolt in accordance with the received signal $\delta B(F)$.

11. A method for adjusting die clearance between an upper die element and a lower die element for an extruder extruding a sheet of material comprising the steps of:

storing the desirable thicknesses of the sheet at a plurality of positions in the direction of width across the sheet;

measuring the thicknesses of the sheet at each said position;

storing the values of spring constant (k) of said adjusting members and a plurality of matrix data $f_{I,J}$ defined as coefficient factors of simultaneous linear equations representing the relationships between each compensating incremental force value (ΔP_1, ΔP_2, $\Delta P_3 \ldots \Delta P_n$);

comparing the measured thicknesses with the desirable thicknesses, thereby producing a difference signal (e_I) by which the die clearance is to be adjusted through an adjusting member located at the position "I";

calculating each increment of forces (ΔP_I, ΔP_2, $\ldots$ ΔP_n) acting on the backface of the die element by solving multiple simultaneous linear equation formed with said values of the difference (e_I), the stored matrix data ($f_{I,J}$) and said each increment of forces;

determining the displacement quantity signal δBI for adjusting members to be adjusted at the position "I" on said die element by adding said difference (e_I) to a compensation value expressed as $\Delta P_I/K$; and

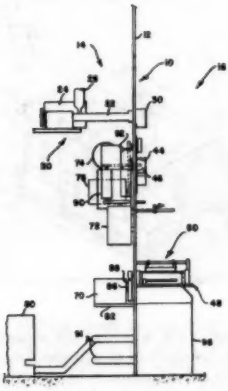
applying said displacement quantity signal to means for applying a force to said adjusting members.

4,514,349

METHOD AND MEANS FOR PRODUCING YARN

Barry Lipschitz, P.O. Box 77, Atlantis, South Africa

Filed May 5, 1983, Ser. No. 491,903
Int. Cl.³ D02G 1/20
U.S. Cl. 264—103 **3 Claims**



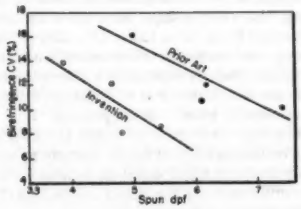
1. In a method of producing yarn in which a filament is coated with a tacky layer of synthetic plastic material and discrete staple fibers are then applied to the coated filament by machinery comprising some parts which necessarily have to be in a staple fiber containing environment and other parts which do not, the improvement which comprises partitioning the factory space in which said yarn is produced so as to provide a first region and a second region, maintaining a pressure differential across said partitioning, the pressure in said first region being lower than that in said second region, said parts which necessarily have to be in a staple fiber environment being in said first region and said other parts being in said second region, said partitioning minimizing transmission of fibers from said first region to said second region.

4,514,350

METHOD FOR MELT SPINNING POLYESTER FILAMENTS

Douglas D. Roth, Matthews, and Fredrick A. Ethridge, Waxhaw, both of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,116
Int. Cl.³ B29F 3/04
U.S. Cl. 264—176 F **11 Claims**



1. An improved process for melt-spinning polymeric filaments comprising (1) extruding the same molten polymer through at least two groups of orifices in a single spinnerette, wherein each group of orifices is arranged in at least one row; (2) directing quench vapor or gas successively across the first group of filaments and thence across the second group of filaments; (3) thereafter collecting partially oriented filaments; wherein the improvement comprises:

extruding at an average mass-flow rate of polymer through the second group of orifices, m_2, that is less than the average mass-flow rate of polymer through the first group of orifices, m_1,

whereby there is less difference in degree of orientation between the first group of melt-spun filaments and the second group of melt-spun filaments.

4,514,351

PROCESS FOR THE MANUFACTURE OF ARTICLES OF HIGH MECHANICAL STRENGTH FROM THERMOPLASTIC SYNTHETIC RESINS

Helmut Kaeufer, Metzkausen; Lutz Rautenberg, and Joachim Pahl, both of Berlin, all of Fed. Rep. of Germany, assignors to Deutsche Solvay Werke GmbH, Solingen, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,291
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133897
Int. Cl.³ B29D 7/08
U.S. Cl. 264—210.2 **20 Claims**

1. A process for preparation of a shaped article of high mechanical strength from a thermoplastic resinous material comprising the steps of:

heat plastifying the thermoplastic material;

extruding the heat plastified thermoplastic material to form an extruded mass;

cooling the extruded mass to a temperature below its melting or softening point;

forcing the extruded mass in a first pressure-forming step either during or subsequent to said cooling step through an outlet orifice having a cross-section which is reduced in relation to the cross-section of said shaped article at a pressure within the range from about 155 N/mm^2 to 1000 N/mm^2; and

introducing the thermoplastic material after said first pressure-forming step into a second pressure-forming step in which the pressure is maintained on said thermoplastic material for a period from about 1 second to 5 minutes to produce an oriented, shaped article having a predetermined cross-sectional configuration;

the ratio of the surface area of the extruded mass per unit weight of the surface area of the shaped article comprising from about 30:1 to 1.1:1.

4,514,352

SHOTSHELL CASING WITH PARTIALLY TELESCOPED BASEWAD

Luke J. Duvich; Jack A. Erickson, both of Anoka, and Richard W. Proulx, Forest Lake, all of Minn., assignors to Federal Cartridge Corporation, Minneapolis, Minn.

Division of Ser. No. 224,267, Jan. 16, 1981, abandoned. This application Sep. 22, 1983, Ser. No. 535,005
Int. Cl.³ B29C 17/02; F42B 7/06
U.S. Cl. 264—230 **14 Claims**

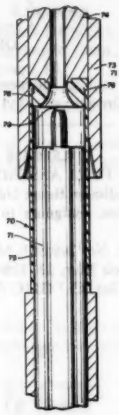
1. The method of producing a cartridge casing consisting in:

(a) heating only the very outer end portion of one end of a biaxially stretched thermoplastic tube having wall structure with inner surfaces only sufficiently to soften same and cause its sidewalls thereat to shorten axially and thicken radially to form an integral dollup supported by relatively rigid sidewalls on that end of the tube;

(b) mechanically telescoping a portion of that dollup from an exterior position to an interior position within the relatively rigid sidewalls which support the dollup; and

(c) forming the telescoped dollup into an integral transverse

internally homogenous base section which is devoid of internal physical boundaries and is disposed in contiguous



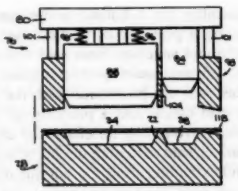
relation with the inner surfaces of the wall structure of the tube and with an axially extending primer opening therein.

4,514,353

APPARATUS AND METHOD FOR FORMING A MULTI-COMPARTMENTED TRAY FROM A SHEET MATERIAL

Garold W. Alexander, Delaware, and William H. Haase, Dublin, both of Ohio, assignors to International Paper Company, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,166
Int. Cl.³ B29C *17/00*
U.S. Cl. 264—294 **13 Claims**



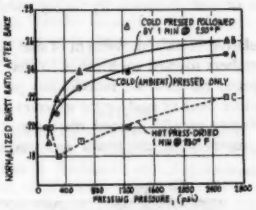
1. An apparatus for forming multi-compartmented trays from sheet material, said apparatus comprising: first and second dies movable relative to each other, between a first relative position in which they are spaced apart and a second relative position in which they fit together; means for moving said dies from said first relative position toward said second relative position for gripping a piece of material between said dies for forming such piece of material into a multi-compartmented tray; said first die including first and second compartment-formers for forming first and second spaced-apart compartments in such piece of material, said first and second compartment-formers being positioned such that the lower surface of said first compartment-former is spaced below an equivalent surface of said second compartment-former so that movement of said dies toward said second relative position causes said first compartment-former to form a first compartment in such piece of material to substantially the full intended depth of such first compartment before said second compartment-former forms a second compartment in such piece of material.

4,514,354

MANUFACTURE OF MOLDED PAPERBOARD ARTICLES

Sheldon I. Schlesinger, East Windsor, N.J.; Walter S. Cerenzia, Morrisville, Pa., and Thomas D. Wilson, Hamilton Square, N.J., assignors to James River-Norwalk, Inc., Norwalk, Conn.

Filed Dec. 10, 1982, Ser. No. 448,647
Int. Cl.³ B29G *5/00*
U.S. Cl. 264—324 **5 Claims**


COLD PRESSED FOLLOWED BY 1 MIN @ 350°F
COLD(AMBIENT)PRESSED ONLY
HOT PRESS-DRIED 1 MIN @ 350° F
NORMALIZED BURST RATIO AFTER BAKE
PRESSING PRESSURE, (psi)

1. A method of forming an ovenable paperboard container from paperboard sheet by press forming between a pair of forming dies, said container having improved burst strength after exposure to a temperature of 450° F. for one hour as compared with that of hot pressed paperboard of the same base stock, which comprises adjusting the moisture content of sheet paperboard base stock consisting of cellulosic fiber pulp to a water content within the range of from about 50% to about 100% by weight based on the dry weight of fiber; pressing said paperboard stock in the absence of externally applied heat into a shaped paperboard container at a pressure in a range from about 325 psi to about 2600 psi; and drying the pressed shaped container.

4,514,355

PROCESS FOR IMPROVING THE HIGH TEMPERATURE FLEXURAL STRENGTH OF TITANIUM DIBORIDE-BORON NITRIDE

Lionel C. Montgomery, Bay Village, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 22, 1982, Ser. No. 452,183
Int. Cl.³ C04B *35/60*
U.S. Cl. 264—332 **8 Claims**

1. A process for producing an intermetallic composition comprising titanium diboride and boron nitride having enhanced high temperature flexural strength characteristics, said process comprising forming a uniform blend of titanium diboride and boron nitride powders containing oxygen in a bond phase, hot pressing said uniform blend in an inert atmosphere at elevated temperatures to form a solid body, discontinuing the hot pressing of the body and subsequently heating the solid body between approximately 1600° C. and 2200° C. in an inert atmosphere for from about four hours to about 10 hours to vaporize said bond phase of said hot pressed body.

4,514,356

METHOD OF MOLDING A PLASTIC TOILET SEAT HINGE CONNECTABLE BED PLATE

David E. Harrison, Star Rte. Box 315, Columbus, Miss. 39701

Division of Ser. No. 418,388, Sep. 15, 1982, Pat. No. 4,391,001. This application Apr. 8, 1983, Ser. No. 483,931
Int. Cl.³ B29F *1/022*; A47K *13/12*
U.S. Cl. 264—328.12 **1 Claim**

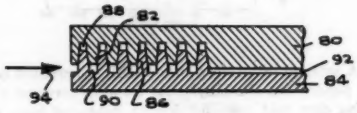
1. A method of molding a plastic toilet seat bed plate having a horizontally extending rectangular opening positioned between upper and lower parallel horizontal rib members of quadrilateral cross-section extending between side wall components, said method comprising the steps of:

providing an upper mold member having a plurality of

upper elongated horizontal downwardly facing parallel spaced rib teeth between which a plurality of linear upper grooves extend in parallel horizontal alignment with each other;

providing a lower mold member beneath said upper mold member having a plurality of elongated horizontal parallel equidistantly spaced upwardly facing spaced rib teeth between which a plurality linear lower grooves extend in parallel horizontal alignment with each other, said linear lower grooves being individually in vertical alignment with one of said downwardly facing parallel spaced rib teeth;

effecting relative vertical movement of said upper and lower mold members toward each other so that said upwardly facing spaced rib teeth are individually partially received in respective ones of said upper grooves and said downwardly facing parallel spaced rib teeth are individually partially received in said lower grooves so that the up-



wardly facing teeth and the downwardly facing teeth are interleaved over a portion of their vertical length with the space occupied by the interleaved portions of the rib teeth being coextensive with the rectangular shape of the horizontally extending opening to be formed and the space in the lower end of said lower grooves not occupied by the upper rib teeth and the upper ends of said upper grooves not occupied by the lower rib teeth being respectively identical in cross-section to said upper and lower horizontal rib members;

injecting molten plastic between said mold members to fill all open spaces between said mold members to provide a body of plastic having the required shape of the toilet seat bed plate;

permitting said molten plastic to solidify;

effecting relative vertical movement between said upper and lower members for achieving separation thereof; and

removing the resultant molded plastic toilet seat bed plate from one of said mold members.

4,514,357

PRODUCTION OF MOLDED ARTICLES HAVING EXCELLENT OPTICAL CHARACTERISTICS

Yoshikazu Kawaguchi; Seiichro Maruyama, and Hiroyuki Kawasaki, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

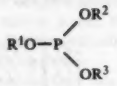
Filed Dec. 15, 1982, Ser. No. 450,039

Claims priority, application Japan, Jan. 22, 1982, 57-8315

Int. Cl.³ B29F *1/08*; B29D *11/00*

U.S. Cl. 264—328.16 **5 Claims**

1. A method for producing a molded article having excellent optical characteristics, the quality of said optical characteristics being established by the fact that said article in molded disc form of 1.2 mm thickness and 120 mm in diameter has a retardation of not more than 60 mμ and a warpage of not more than 0.2 mm, comprising: injection molding, at a resin temperature of 330° to 400° C. and at a mold temperature of 50° to 110° C., a resin composition of bis(hydroxyphenyl)alkane polycarbonate having an average molecular weight of 12,000 to 18,000 and containing 0.005 to 0.5 wt. %, based on the polycarbonate resin, of a phosphorous ester of the formula:



wherein each of R^1 and R^2 independently is an alkyl or aryl group, and R^3 is hydrogen, an alkyl group or aryl group.

4,514,358

FUEL ASSEMBLY

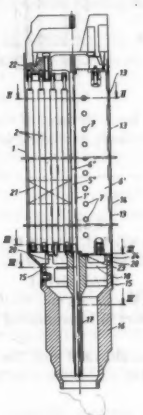
Bo Borrman; Erik Hellman; Bengt Ode, and Aart van Santen, all of Västerås, Sweden, assignors to AB ASEA-ATOM, Västerås, Sweden

Continuation of Ser. No. 249,561, Mar. 31, 1981, abandoned.

This application Mar. 23, 1984, Ser. No. 592,741

Int. Cl.³ G21C *15/00*

U.S. Cl. 376—362 **6 Claims**



1. A fuel assembly for a boiling water reactor, said fuel assembly including a plurality of vertical fuel rods enclosed within a fuel channel separate from said fuel rods, said fuel channel being of substantially rectangular cross-section, wherein said fuel rods are positioned with the aid of top grid means, bottom grid means and a plurality of spacer devices, said fuel channel surrounding an elongated stiffening device for said fuel channel, said stiffening device being separate from said fuel rods and extending along a predominant portion of the length of said fuel rods, the vertical center line of said stiffening device lying in the vicinity of the vertical center line of said fuel channel, said stiffening device having four stiffening wings arranged in vertical planes and having angular distances of about 90° between themselves, said stiffening wings below said top grid means and above said bottom grid means being mechanically and fixedly connected to each other in the vicinity of the vertical center line of said fuel channel and welded to corresponding walls of said fuel channel to prevent said fuel channel from deforming outwardly during reactor operation, said wings constituting partitions between four bundles of fuel rods and each of said wings comprising at least one vertical internal water passageway extending along a predominant portion of the length of said fuel rods, whereby water flowing upward through said internal water passageway is prevented from contacting said fuel rods thus minimizing the void content of the water in said internal water passageway while maximizing its moderator effect, and said stiffening device comprising for elongated vertical sheet-metal bodies of substantially L-shaped cross-section arranged in spaced relationship to each other to define said water passageways, the cor-

ners of said sheet-metal bodies being disposed in the vicinity of said vertical center line of said fuel channel.

4,514,359

NONPRECIOUS DENTAL ALLOY

Henry L. Andrews, Old Saybrook, Conn., assignor to Austenal International, Inc., Chicago, Ill.

Filed Mar. 30, 1983, Ser. No. 480,426
Int. Cl.³ C22C *19/07*
U.S. Cl. 420—436 **2 Claims**

1. A nonprecious dental alloy consisting essentially of the following constituents in approximate percentage by weight:

chromium—25–30
molybdenum—5–7
manganese—0–1.0
silicon—0–1.0
carbon—0–0.3
gallium—1.5–3
indium—1.5–3
cobalt—balance

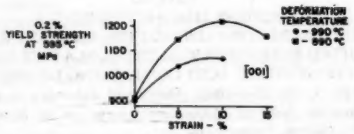
said constituents accounting for at least 99.5 weight percent of the alloy, the sum of the manganese and the silicon being at least about 0.5 percent.

4,514,360

WROUGHT SINGLE CRYSTAL NICKEL BASE SUPERALLOY

Anthony F. Giamei, Middletown, Conn., and Bernard H. Kear, Whitehouse Station, N.J., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1982, Ser. No. 447,067
Int. Cl.³ C22C *19/05*; C21D *8/00*
U.S. Cl. 420—454 **10 Claims**



8. A single crystal nickel base superalloy of the gamma-gamma prime type having a composition substantially free of boron, hafnium and zirconium, less than 0.03 carbon, and 40–70 volume percent gamma prime, produced by deforming the alloy 2–15% at a strain rate of 10^{-1} to 10^{-4} second^{-1} in the temperature range 700°–1100° C., said superalloy having a yield strength at least 15 percent greater than the same composition and heat treatment superalloy which has not been deformed, and the superalloy having a tensile yield strength in the crystal [001] direction of at least about 1000 MPa at 595° C.

4,514,361

STEAM STERILIZATION INDICATOR

Arthur Hirsch, Elizabeth, N.J., assignor to Arvey Corporation, Chicago, Ill.

Filed Sep. 24, 1982, Ser. No. 423,242
Int. Cl.³ A61L *2/06*; G01N *21/80, 31/22*
U.S. Cl. 422—26 **9 Claims**

2. A steam sterilization indicator comprising a carrier, a pH value indicator that exhibits a change in color at a pH value of about 5.8 to about 6.2 affixed to said carrier and an acidic chemical composition associated with said carrier, the pH value of said acidic chemical composition increasing under steam sterilizing conditions to exceed a pH value of about 5.8 to about 6.2, said acidic chemical composition containing a mixture of a first and a second carboxyl group-containing submixture, said mixture including 2,4-dihydroxybenzoic acid and a salt of 2,4-dihydroxybenzoic acid as the first of said submixtures, and phenylpropiolic acid and a salt of phenylpropiolic acid as the second of said submixtures, the molar ratio of said first and second carboxyl group-containing submixtures to each other being about 1:4 to about 4:1.

7. A method for indicating that an article has been sterilized by steam comprising the steps of:

supplying the steam sterilization indicator of claim 2;

placing said indicator into a steam sterilizing apparatus along with an article to be sterilized and closing said apparatus;

supplying pressurized steam into the closed sterilizing apparatus; and

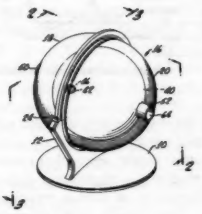
maintaining said supply of pressurized steam into said closed sterilizing apparatus until the color of the pH value indicator changes, thereby indicating that the pH value of said composition exceeds about 5.8 to about 6.2, and that said article has been sterilized.

4,514,362

BREATH SPECIMEN MIXER

Frank L. Buchanan, Jr., 4812 Frieda Dr., Los Angeles, Calif. 90065, and Bob B. Buchanan, 23721 Monument Canyon Dr., Diamond Bar, Calif. 91765

Filed Oct. 28, 1982, Ser. No. 437,351
Int. Cl.³ G01N *1/00*; B01F *5/00*; B01L *11/00*
U.S. Cl. 422—99 **2 Claims**



1. Apparatus for mixing a heterogeneous gas specimen to produce a substantially homogeneous product consisting essentially of:

a hollow container having means forming an inlet opening and an outlet opening coaxial with said inlet opening through the walls thereof for introducing said heterogeneous gas specimen and withdrawing said product, said container including an aligned pair of substantially hemispherically shaped halves and means for detachably clamping said halves together to form an easily disassemblable unit, the walls of said container defining a chamber which is substantially symmetrical about an axis centered in said openings,

mixing means positioned within said container substantially spaced apart from the inner surfaces of the walls thereof for causing said gas specimen to be disbursed and mixed about said means upon passage through said container from said inlet opening to said outlet opening, said mixing means comprising a globe suspended within said container so that its center is positioned substantially on said axis of the inlet and outlet opening in said container, said globe ranging in volume from about one third to about two thirds the interior volume of said container, said globe being substantially concentric with said container but spaced apart therefrom,

suspension means comprising a plurality of spring members affixed about the inner surface of one of said hemispherically shaped halves for detachably engaging said globe for suspending the same, while permitting said globe to be easily removed from said container, said globe including engaging means affixed to the outer surface of said globe and positioned to engage said spring means,

said clamping means comprising opposing aligned flanges on said hemispherically shaped halves and an arcuate channel

member for enclosing and sealingly clamping together the periphery of a substantial portion of said flanges, and

a base member for supporting said container, said channel member being mounted on said base member facing arcuately upwardly, said channel member being sized to engage a substantial portion of but less than half of said periphery of said flanges.

4,514,363

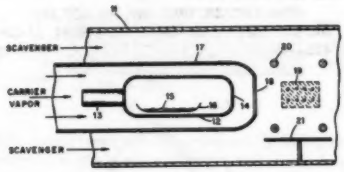
METHOD FOR ISOTOPE ENRICHMENT BY PHOTOINDUCED CHEMIIONIZATION

James W. Dubrin, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 150,251, May 2, 1980, abandoned, which is a continuation of Ser. No. 683,156, May 4, 1976, abandoned. This application Sep. 15, 1981, Ser. No. 302,341

Int. Cl.³ B01D *59/00*

U.S. Cl. 423—3 **7 Claims**



1. A method for isotope enrichment wherein the isotope source is an atomic vapor of uranium present in a plurality of isotopes, said atomic vapor being characterized by an absorption spectrum exhibiting a significant isotope shift such that there exists a frequency at which irradiation of said vapor excites atoms of a first isotope of the element without substantially exciting atoms of a second isotope of the element, which method comprises:

a. providing a vapor phase mixture of said atomic vapor and a reactant species capable of transforming excited atoms of said element into an ionic product by a chemiionization reaction without substantial reaction with unexcited atoms of said element under the conditions of said irradiation, said reactant species being selected from the group consisting of a halogen, an alkali metal atom, an alkaline earth metal atom, a Group III metal, CO and NH_3;

b. subjecting said vapor phase mixture to irradiation at said frequency, thereby exciting atoms of said first isotope without substantially exciting atoms of said second isotope and transforming the excited atoms into an ionic product enriched in said first isotope by said chemiionization reaction without substantial transformation of the unexcited atoms into an ionic product; and

c. electrically extracting the resulting ionic product enriched in said first isotope from the vapor mixture.

4,514,364

METHOD FOR REPROCESSING A NUCLEAR REACTOR FUEL ROD

Wolfgang Stoll, Hanau, and Karl Ennerst, Kleinostheim, both of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,142

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228979

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—4 **5 Claims**

1. Method for reprocessing a nuclear reactor fuel rod which contains nuclear fuel in pellet form in a metal cladding tube to effect separation of the cladding tube from the nuclear fuel, which comprises uniformly heating the cladding tube in hermetically sealed condition together with the nuclear fuel contained therein to permanently expand the diameter of the cladding tube without the formation of cracks in the cladding tube, increasing the distance between the nuclear fuel and the cladding tube to permit the nuclear fuel to freely flow from the

cladding tube; opening the expanded cladding tube at one end; separating the nuclear fuel from the cladding tube by discharging the nuclear fuel through the opening in the cladding tube, and recovering the separated nuclear fuel substantially free of cladding tube content.

4,514,365

PROCESS FOR RECOVERING A URANIUM-CONTAINING CONCENTRATE AND PURIFIED PHOSPHORIC ACID FROM A WET PROCESS PHOSPHORIC ACID CONTAINING URANIUM

Cornelis A. M. Weterings, Stein, and Johannes A. Janssen, Schinveld, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 115,248, Jan. 21, 1980,. This application Nov. 5, 1982, Ser. No. 439,599

Claims priority, application Netherlands, Jan. 25, 1979, 7900579; Jan. 25, 1979, 7900580; Jan. 25, 1979, 7900581

Int. Cl.³ C01G *43/06, 43/00*

U.S. Cl. 423—15 **12 Claims**

1. Process for recovering a uranium containing concentrate and a purified phosphoric acid from a wet process phosphoric acid comprising the steps of,

(a) treating said wet process phosphoric acid first with (i) from about 0.15% to about 7% by weight of ammonium fluoride calculated as fluoride in relation to the amount by weight of P_2O_5 in the phosphoric acid, and (ii) a reducing agent, and thereafter with from about 120% to about 900% by weight of an aliphatic ketone calculated in relation to the amount by weight of P_2O_5 in the phosphoric acid, to form an uranium containing precipitate,

(b) separating said precipitate from the remaining mixture of phosphoric acid and aliphatic ketone, and

(c) recovering purified phosphoric acid from said mixture of phosphoric acid and aliphatic ketone.

2. The process of claim 1, wherein the aliphatic ketone is selected from the group consisting of acetone, methylethylketone, or mixture thereof.

5. Process for recovering a uranium containing concentrate and a purified phosphoric acid from a wet process phosphoric acid containing uranium wherein the sulphate content of said wet process phosphoric acid is less than about 0.6% by weight calculated in relation to the amount by weight of P_2O_5 comprising the steps of,

(a) admixing, to a wet process phosphoric acid containing uranium, a compound that reacts with sulphate ions to

form a resultant precipitate that is insoluble in phosphoric acid,

(b) separating out the resultant precipitate from the wet process phosphoric acid containing uranium,

(c) treating the wet proces phosphoric acid containing uranium of step (b) first with (i) from about 0.15% to about 7% by weight of ammonium fluoride calculated as fluorine in relation to the amount by weight of P_2O_5 in the phosphoric acid, and (ii) a reducing agent and thereafter with from about 120% to about 900% by weight of an aliphatic ketone calculated in relation to the amount by weight of P_2O_5 in the phosphoric acid to form a resultant uranium containing precipitate,

(d) separating out said uranium containing precipitate from the remaining mixture of phosphoric acid and aliphatic ketone, and

(e) recovering the phosphoric acid from said mixture of phosphoric acid and aliphatic ketone.

4,514,366

PRODUCTION OF FLUID FERTILIZER FROM PHOSPHORUS FURNACE WASTE STREAM

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Division of Ser. No. 428,840, Sep. 30, 1983, Pat. No. 4,451,277, which is a continuation-in-part of Ser. No. 301,378, Sep. 11, 1981, Pat. No. 4,383,847, which is a division of Ser. No. 223,122, Jan. 7, 1981, Pat. No. 4,372,929. This application Jun. 10, 1983, Ser. No. 502,929

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—318 **6 Claims**

1. A process for the production of phosphoric acid wherein:

(a) A mixture of phosphate ore containing fluoroapatite, phosphoric acid, and ground phosphate is agglomerated by tumbling;

(b) agglomerates in step (a) are indurated in the temperature range of 220° to 1500° F.;

(c) indurated agglomerates in step (b) are mixed with reducing carbon and silica rock;

(d) mixture in step (c) is smelted in a submerged-arc electric furnace wherein a phosphorus-containing gas is evolved;

(e) phosphorus-containing gas in step (d) is cooled in an adiabatic condenser wherein water is sprayed into the condenser, collected in a sump, and recirculated in a stream to the condenser;

(f) a stream of water is bled off;

(g) phosphorus and phosphorus sludge condensed in the adiabatic condenser is separated by gravitational settling;

(h) phosphorus sludge in step (g) is burned in a graphite combustion chamber to produce a gas and phosphoric acid

(i) gases from combustion chamber in step (h) are contacted with bleedoff water from step (f) in a hydrator constructed of carbon blocks;

(j) gases from hydrator in step (i) are treated in a venturi scrubber;

(k) phosphoric acid collected in combustion chamber, hydrator, and venturi scrubber is recycled to step (a);

(l) liquid phosphorus separated in step (g) is processed into phosphoric acid in a stainless steel production unit.

4,514,367

METHOD FOR SEPARATING RARE EARTH METALS

Tadao Asami, Yokohama; Tetsuro Suehiro; Hisao Ichijo, both of Yatabemachi; Aizo Yamauchi, Sakuramura; Shigeo Ogawa, Yatabemachi; Mitsuo Suzuki, and Mitsutaka Uzumaki, both of Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology; Nitivy Co., Ltd. and Seimi Chemical Co., Ltd., all of, Japan

Filed May 25, 1983, Ser. No. 497,871

Int. Cl.³ C01F *17/00*

U.S. Cl. 423—21.5 **3 Claims**

1. In a method for separating gadolinium, samarium, neodymium, praseodymium, and lanthanum prepared from bastnaesite by selective adsorbing these rare earth metals on an ion exchanger and then fractionally eluting the respective metals with an aqueous solution of a chelating agent, the improvement in that an ion exchange fiber having a sulfonic group and a carboxyl group is used as the ion exchanges, and the elution is conducted at a space velocity of 5.0 or above.

4,514,368

LEACHING NICKEL, COBALT, MOLYBDENUM, TUNGSTEN, AND VANADIUM FROM SPENT HYDROPROCESSING CATALYSTS

Gale L. Hubred, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1982, Ser. No. 422,761

Int. Cl.³ C01G *39/00, 41/00, 31/00, 51/00*

U.S. Cl. 423—54 **4 Claims**

1. A process to extract nickel, vanadium, cobalt and molybdenum from spent hydroprocessing catalyst particles containing carbon residue comprising:

(a) roasting said catalyst particles in an atmosphere containing molecular oxygen at a temperature in the range of between about 400° C. and 600° C.; and

(b) contacting said roasted catalyst particles with an aqueous solution of ammonia and a compound selected from the group consisting of ammonium carbonate and ammonium sulfate, said solution being maintained at a temperature in the range of 85° C. to 95° C., wherein said aqueous solution has a pH in the range of 9.5 to 11 and concentrations of ammonia plus ammonium do not exceed 6M, such that at least 85 percent of molybdenum, 70 percent of vanadium, 45 percent cobalt, and 70 percent nickel is recovered from said roasted catalyst particles.

2. The process of claim 1 wherein said aqueous solution contains at least six-fold molar ratio of ammonia compared to the nickel and cobalt on said catalyst particles, and less than 2M concentration of ammonium ion.

3. The process of claim 1 including monitoring the concentration of cobalt leached, thereby leaching the maximum amount of cobalt.

4,514,369

RECOVERY OF COBALT, MOLYBDENUM, NICKEL, TUNGSTEN AND VANADIUM FROM AN AQUEOUS AMMONIA AND AMMONIUM SALT SOLUTION BY COEXTRACTING MOLYBDENUM, TUNGSTEN AND VANADIUM AND SEQUENTIAL EXTRACTION OF NICKEL AND COBALT

Gale L. Hubred, Richmond, and Dean A. Van Leirsburg, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 422,987, Sep. 24, 1982, Pat. No. 4,434,141. This application Feb. 22, 1984, Ser. No. 582,366

The portion of the term of this patent subsequent to Feb. 22, 2001, has been disclaimed.

Int. Cl.³ C01G *39/00, 41/00, 51/00, 31/00*

U.S. Cl. 423—54 **5 Claims**

1. A process for separating the metal values in a pregnant liquor from an ammoniacal ammonium aqueous leach solution containing:

(i) at least one metal value selected from the group consisting of cobalt and nickel; and

(ii) at least one metal value selected from the group consisting of vanadium, tungsten, and molybdenum; comprising:

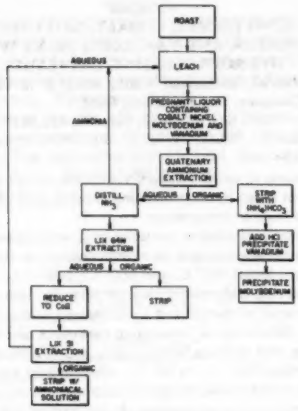
(a) transferring said molybdenum, tungsten, and vanadium metal values from said pregnant liquor into a first organic solution by means of a first organic liquid extractant comprising a quaternary ammonium compound;

(b) stripping said first organic solution with a first aqueous ammonium bicarbonate stripping solution to form an aqueous solution containing said molybdenum, tungsten, and vanadium metal values;

(c) transferring nickel metal values from said pregnant liquor into a second organic solution by means of an organic nickel extractant comprising an oxime;

(d) reducing cobalt metal values in said pregnant liquor to divalent cobalt;

(e) transferring cobalt metal values from said pregnant liquor into a third organic solution by means of an



organic cobalt extractant selected from the group consisting of dioximes, hydroxy-oximes, and beta-diketone; and

(f) stripping each of said second and third organic solutions with aqueous stripping solutions to form a cobalt-containing aqueous solution and a nickel-containing aqueous solution.

4,514,370

PROCESS FOR PREPARING SILICON NITRIDE POWDER

Hiroshi Inoue, Kawaguchi; Katsutoshi Komeya, Oiso; Akihiko Tsuge, Yokohama; Kazunari Koide, Kariya; Masaaki Mori, Okazaki, and Tetsuro Urakawa, Kariya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Toshiba Ceramics Co., Ltd, Tokyo, both of, Japan

Continuation of Ser. No. 443,680, Nov. 22, 1982, abandoned.
This application Jun. 8, 1984, Ser. No. 618,524
Claims priority, application Japan, Nov. 25, 1981, 56-187762
Int. Cl.³ C01B *21/068*
U.S. Cl. 423—344 **13 Claims**

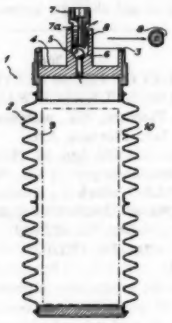
1. A process for preparing silicon nitride powder, which comprises baking a powdery mixture comprising (i) 1 part by weight of silica powder, or a silica-containing substance in terms of silica, (ii) 0.4 to 4 parts by weight of carbon powder, or a substance generating carbon by baking, in terms of carbon and (iii) 0.005 to 1 part by weight of silicon nitride powder synthesized by a silica reduction method, at a temperature of from 1350° to 1550° C. in a nonoxidative atmosphere containing nitrogen.

4,514,371

PROCESS AND DEVICE FOR THE ACCELERATED DENSIFICATION OF A POROUS CARBONACEOUS SUBSTRATE BY DECOMPOSITION OF A HYDROCARBON SUBSTANCE

Jean Jamet, Janvry; Jean-Jacques Poupeau, Saint-Remy-les-Chevreuse; Jacqueline Omnès, Paris, and Claude Le Pennec, Vincennes, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatilcon, both of, France

Continuation of Ser. No. 244,877, Mar. 18, 1981, abandoned.
This application Jul. 8, 1983, Ser. No. 511,724
Claims priority, application France, Mar. 28, 1980, 80 07034; Sep. 18, 1980, 80 20089
Int. Cl.³ C01B *31/04, 31/02*
U.S. Cl. 423—449 **1 Claim**



1. A process for the accelerated densification of a porous carbonaceous substrate comprising decomposing a hydrocarbon substance in the presence of said substrate under high pressure and at a high temperature, decomposition being effected inside a closed reactor allowing the elimination of hydrogen as it is produced during the reaction, the walls of said reactor having the necessary suppleness for the inner volume thereof to be adapted at each instant under the effect of the pressure applied to the volume of a liquid phase which it contains, the hydrocarbon substance to be decomposed being a substance containing free carbon in the amount of about 30% by weight.

4,514,372

PROCESS OF PRODUCING COBALT-CONTAINING SOLUTIONS AND SALTS

Eric A. Devuyst, Toronto, and Victor A. Ettel, Mississauga, both of Canada, assignors to INCO Limited, Toronto, Canada

Filed Mar. 9, 1983, Ser. No. 404,613
Int. Cl.³ C01G *51/08*
U.S. Cl. 423—493 **8 Claims**

1. The process for dissolving metallic cobalt in hydrochloric acid solution characterized in that said hydrochloric acid solution contains thiosulfate ion.

4,514,373

PURIFICATION OF ALUMINUM CHLORIDE

Ronald Wyndham, Thibodaux, La., assignor to Toth Aluminum Corporation, Metairie, La.

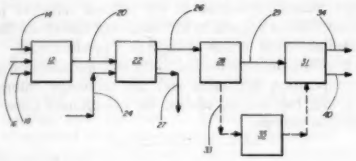
Filed Dec. 6, 1983, Ser. No. 558,539
Int. Cl.³ C01F *7/62*
U.S. Cl. 423—495 **17 Claims**

1. A process for purifying aluminum chloride comprising the steps of:

a. providing solid crude aluminum chloride containing at least one sulfur containing member selected from the group consisting of elemental sulfur and/or functionally equivalent sulfur containing compounds;

b. adding at least one solid aluminum containing member selected from the group consisting of elemental aluminum and/or functionally equivalent aluminum containing compounds to said crude aluminum chloride to form a blend;

c. heating the blend of solid crude aluminum chloride containing sulfur and the aluminum metal to at least 180° C. under at least one atmosphere of pressure; and



d. subliming substantially pure aluminum chloride from the solid blend, the at least one sulfur containing member contained in the solid blend being present in an amount to increase the yield and rate of formation of pure aluminum chloride.

4,514,374

METAL BROMIDE PREPARATION

Warren B. Kirsch, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 15, 1982, Ser. No. 434,504
Int. Cl.³ C01F *11/34*
U.S. Cl. 423—497 **6 Claims**

1. A process for preparing an aqueous metal bromide solution which comprises contacting in an aqueous medium a compound selected from the group consisting of calcium hydroxide, calcium carbonate and lime, with bromine in the presence of a lower alkanol as a reducing agent, the amount of lower alkanol being stoichiometric to slightly in excess of stoichiometric based upon bromine wherein said stoichiometric amount is about 1 mole of alkanol for each 3 moles of bromine.

4,514,375

METHOD OF RECOVERING SULFUR FROM THE HYDROGEN SULFIDE CONTAINED IN COKE OVEN GASES

Dieter Laufhütte, Recklinghausen, Fed. Rep. of Germany, assignor to Firma Carl Still G.m.b.H. & Co. KG, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,495
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209858
Int. Cl.³ C01B *17/02*; C01C *3/00*
U.S. Cl. 423—573 G **2 Claims**

1. A method of treating hydrogen sulfide and ammonia vapors that are stripped from coke oven gases having hydrogen sulfide and ammonia therein, to recover sulfur from the hydrogen sulfide contained in the gases under a Claus treating plant process, comprising:

washing ammonia and hydrogen sulfide out of the coke oven gases in a closed cycle water and ammonia scrubber to form a raw vapor and stripping the raw vapor of wash liquors and concentrating the stripped raw vapor to form the hydrogen sulfide and ammonia vapors to be treated, the hydrogen sulfide and ammonia vapors containing hydrogen cyanide and hydrocarbon;

directing the vapors (**1**) along with combustion (**2**) and oxidation (**3**) gases, into a first combustion furnace (**5**) and buring them therein to form a burned vapor including ammonia and hydrogen sulfide, sufficient combustion and oxidation gases being directed with the hydrogen sulfide and ammonia vapors in the first combustion furnace to burn the vapors and raise their temperature to a range between 1000° and 1200° C.;

directing the burned vapor through a nickel catalyzer (**6**) to decompose the burned vapor and the ammonia present therein to form decomposed gases, the burned vapor being supplied to the nickel catalyzer at the temperature range of 1000° to 1200° C., hydrogen sulfide in the burned vapor being uneffected in the nickel catalyzer;

supplying about one-third of the decomposed gases (**8**) directly to a burner (**10**) of a second furnace (**11**) for burning;

supplying a remaining two-thirds of the decomposed gases (**12**) into a cooler (**39**) to cool them and to liberate condensate therefrom to form liberated gases;

directing the liberated gases (**16**) into the second furnace (**11**) to form at least some sulfur dioxide;

adding air (**9**) to the burner (**10**) in an amount to partly combust the liberated gases with the relative one-third and two-thirds amounts of decomposed gases being selected to regulate a proportion of the hydrogen sulfide to sulfur dioxide needed for the Claus plant process to be 2 to 1;

cooling the gases from the second furnace which are partially combusted to 200° to 250° C.; and

delivering gases from the second furnace which are partially combusted and cooled, to the Claus plant process to obtain sulfur.

4,514,376

PREGENERATION OF TETRAHYDROANTHRAQUINONES IN A MAKE-UP SOLUTION TO BE ADDED TO A HYDROGEN PEROXIDE WORKING SOLUTION

Dalbir S. Sethi, Cranbury, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 19, 1984, Ser. No. 601,834
Int. Cl.³ C01B *15/02*
U.S. Cl. 423—588 **23 Claims**

1. In a process for producing hydrogen peroxide by the cyclic steps of reducing, oxidizing, and extracting a working solution containing as a working compound an alkylated anthraquinone and the corresponding hydroquinone, tetrahydroanthraquinone and tetrahydroanthrahydroquinone, the improvement which comprises increasing the mol ratio of the nuclearly-hydrogenated, tetrahydro components of the working compound in a first solution which is to be added to the working solution by adjusting the concentration of the non-nuclearly hydrogenated working compounds to be not greater than the maximum solubility of the alkylated anthrahydroquinone formed in the first solution at the hydrogenation temperature, hydrogenating the first solution in the presence of a palladium catalyst at a pressure of 50 to 400 kilopascals at a temperature of not greater than 50° C. thereby increasing the mol ratio of the tetrahydro components of the working compound without forming substantial quantities of undesirable by-products and adding said hydrogenated first solution to the working solution.

4,514,377

PROCESS FOR THE EXCHANGE OF HYDROGEN ISOTOPES BETWEEN STREAMS OF LIQUID WATER AND GASEOUS HALOHYDROCARBON AND AN APPARATUS THEREFOR

Edward A. Symons; John H. Rolston, both of Deep River; Michel J. Clermont, Ottawa, and Linda M. Paterson, Petawawa, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

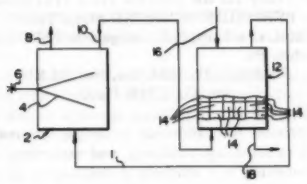
Filed Nov. 26, 1982, Ser. No. 444,860
Claims priority, application Canada, Dec. 4, 1981, 391537
Int. Cl.³ C01B *5/00*
U.S. Cl. 423—648 A **13 Claims**

1. A process for the exchange of hydrogen isotopes between

streams of liquid water and gaseous halohydrocarbon comprising:

(a) bringing the streams into contact with one another, and a catalytically active mass, of packing elements each comprising a roll of a corrugated open mesh screen and a plane web and a catalyst filling in the roll consisting of a porous anion exchange resin in the hydroxide ion form, the screen and the web being wound together with open, corrugation interstices for the flow of liquid water and gaseous fluoroform therealong, the streams and catalytically active mass being brought into contact at an operating temperature in the range of the order of 0° to 100° C., the liquid water stream containing a concentration of a hydrogen isotope in excess of that which it would contain when the liquid water and gaseous halohydrocarbon streams are in isotopic equilibrium at the operating conditions of temperature and mass flow rates of the streams, and the gaseous halohydrocarbon stream being a deficient stream and containing a concentration of that hydrogen isotope which is less than that which it would contain when the liquid water and gaseous halohydrocarbon streams are in equilibrium at said operating conditions, so that the said deficient, gaseous halohydrocarbon stream is enriched by transfer of that hydrogen isotope from the liquid water stream,

(b) decomposing the said gaseous halohydrocarbon stream enriched in that hydrogen isotope by isotope selective photo-decomposition into a first stream of gaseous products, enriched in that hydrogen isotope, and a second stream of gaseous halohydrocarbon depleted in that hydrogen isotope,



(c) removing as a product the first stream enriched in that isotope, and

(d) recycling the second stream for enrichment once again with that hydrogen isotope.

6. Hydrogen isotope exchange apparatus for effecting exchange between streams of liquid water and gaseous halohydrocarbon comprising:

(a) a catalytically active mass of packing elements each comprising a roll of a corrugated open mesh screen and a plane web and a catalyst filling in the roll consisting of a porous anion exchange resin in the hydroxide ion form, the screen and the web being wound together with open, corrugation interstices for the flow of liquid water and gaseous fluoroform therealong,

(b) contacting means, comprising an ion exchange column containing the packing elements as a catalyst packed bed, for bringing the streams into contact with one another, and the catalytically active mass, at an operating temperature in the range of the order of 0° to 100° C., whereby, when the liquid water stream in the said contacting means containing a concentration of a hydrogen isotope in excess of that which it would contain when the liquid water and gaseous halohydrocarbon streams are in isotopic equilibrium at the operating conditions of temperature and mass flow rates in the said contacting means, and the gaseous halohydrocarbon stream being a deficient stream and containing a concentration of that hydrogen isotope which is less than that which it would contain when the liquid water and halohydrocarbon streams are in equilibrium at said operating conditions, the deficient, gaseous halohydrocarbon stream will be enriched by transfer of that hydrogen isotope from the liquid water,

(c) isotope selective photo-decomposition apparatus for decomposing the said gaseous halohydrocarbon stream enriched in that hydrogen isotope into a first stream of gaseous products, enriched in that hydrogen isotope, and a second stream of gaseous halohydrocarbon depleted in that hydrogen isotope,

(d) pipe means connected to the isotope selective photo-decomposition apparatus for removing therefrom the first stream enriched in that isotope as a product, and

(e) a recycling pipe connected to the isotope selective photo-decomposition apparatus and the exchange column for recycling the second stream for enrichment once again with that isotope.

4,514,378

PROCESS FOR RECOVERING URANIUM FROM SPENT SHALE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 7, 1983, Ser. No. 482,750
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—18 **9 Claims**

1. A process for recovering uranium from spent shale comprising:

(a) treating the spent shale with an effective amount of a compound selected from the group consisting of methanol, a mixture of methanol and water, and a mixture of methanol mixed with sodium methoxide at a temperature of between about 240° and 450° C. and a pressure of atmospheric or higher;

(b) leaching the treated spent shale with an aqueous acid solution so as to dissolve uranium from the spent shale; and

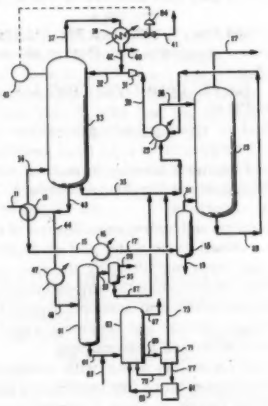
(c) recovering uranium from the leaching solution.

4,514,379

CATALYTIC PROCESS FOR CONVERTING 2-OXAZOLIDINONES TO THEIR CORRESPONDING ALKANOLAMINES

Alex E. Miller, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 28, 1983, Ser. No. 508,719
Int. Cl.³ B01D *53/34*; C07C *91/04*
U.S. Cl. 423—228 **21 Claims**



11. A process for removing CO_2 from a gas stream which comprises:

(a) contacting said gas stream with an absorption solution

comprising an alkanolamine to provide a spent absorption solution comprising absorbed CO_2,

(b) desorbing CO_2 from said spent absorption solution to provide a regenerated absorption solution comprising said alkanolamine and an oxazolidinone compound derived from said alkanol amine and CO_2,

(c) passing a slip-stream of said regenerated absorption solution to a reclaimer and therein distilling overhead said alkanolamine and recovering a bottoms comprising said oxazolidinone compound and said alkanolamine, said alkanolamine being present in said bottoms in an amount effective to eliminate the induction period of the hydrolysis of said oxazolidinone compound,

(d) passing said bottoms to a hydrolysis zone and therein heating said bottoms to hydrolyze said oxazolidinone compound to its alkanolamine precursor, and

(e) passing said hydrolyzed bottoms to a distillation zone and therein distilling overhead said alkanolamine and recovering a residue comprising said oxazolidinone compound and compounds having a boiling point higher than said oxazolidinone compound.

4,514,380

METHOD OF PREPARING TETRARHODIUM DODECACARBONYL

Douglas L. Hunter, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 9, 1984, Ser. No. 569,356
Int. Cl.³ C01G *1/04*
U.S. Cl. 423—417 **4 Claims**

1. In a process for preparing tetrarhodium dodecacarbonyl by reacting rhodium trichloride with carbon monoxide in the presence of activated copper metal and an alkali metal halide under a pressure greater than atmospheric, the improvement which comprises conducting the reaction at a pressure of from about 50 to about 500 psig (3.52 to 35.2 kg/cm^2) and at a temperature of 25°–75° C. for a time of less than about two hours.

4,514,381

Patent Not Issued For This Number

4,514,382

ORAL PRODUCT FOR CONTROLLING GINGIVITIS

Abdul Gaffar, Somerset; Calvin B. Davis, Newark, and Margita L. Vasers, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 442,405, Nov. 17, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 570,446
Int. Cl.³ A61K *7/22, 7/16*
U.S. Cl. 424—54 **11 Claims**

1. An oral composition, which is a mouthwash having a pH of about 5 to 7.5, for treating gingivitis and periodontitis comprising an oral vehicle and an effective amount, which is about 0.1–5% by weight, of the water insoluble antigingivitis agent, 1-imidazoyl-1-(p-chlorophenoxy)3-3-dimethyl 2-butanone, solubilized in a nonionic compound containing a hydrophobic radical and about 10–80% by weight of hydrophilic units of polyoxyethylene of sufficient length to effect solubilization, in the weight ratio of 3:1 to 25:1 nonionic; antigingivitis agent, said agent being selectively effective against the gram negative anaerobic microorganisms *Bacteriodes assaccharolyticus, Bacteriodes gingivalis* and mixtures thereof.

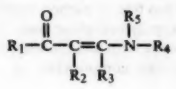
4,514,383

SUNSCREEN COMPOSITIONS CONTAINING VINYLOGOUS AMIDES

William V. Murray, Belle Mead; Charles E. Clum, Kingston, and Elvin R. Lukenbach, Somerset, all of N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed May 5, 1982, Ser. No. 375,072
Int. Cl.³ A61K *7/42, 31/13*
U.S. Cl. 424—59 **7 Claims**

1. A sunscreen composition comprising an extending medium and from about 1 to 20% by weight of the total composition of at least one vinylogous amide compound of the formula



wherein

R_1 is selected from alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, substituted aryl or alkaryl of from 1 to 18 carbon atoms;

R_2 and R_3 may be the same or different and are selected from hydrogen, alkyl, alkenyl, cycloalkyl or cycloalkenyl of from 1 to 18 carbon atoms;

R_4 and R_5 may be the same or different and are selected from hydrogen, alkyl, alkenyl, aryl and substituted aryl, alkaryl, cycloalkyl or cycloalkenyl of from 1 to 18 carbon atoms.

4,514,384

HEMORRHOID TREATMENT METHOD

Damian J. Gallina, 2856 W. 33rd St., Erie, Pa. 16506

Filed Mar. 14, 1983, Ser. No. 475,342
Int. Cl.³ A61K *31/56, 31/79*
U.S. Cl. 424—80 **15 Claims**

1. A method of treating hemorrhoids by applying to hemorrhoidal tissues a composition comprising hydrocortisone and a peroxide selected from the group of urea hydrogen peroxide and benzoyl peroxide in pharmaceutically effective amounts for treatment of said hemorrhoidal tissues.

5. A method of treating hemorrhoids as set forth in claim 1 wherein said composition includes a vehicle of polyvinylpyrrolidone.

4,514,385

ANTI-ACNE COMPOSITIONS

Nalinkant C. Damani; Haresh G. Bhagat, and Ramon L. McElhaney, all of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Oct. 5, 1981, Ser. No. 308,385
Int. Cl.³ A61K *31/78, 31/605*
U.S. Cl. 424—81 **6 Claims**

1. A stable single phase composition for the treatment of acne and seborrhea comprising:

an aqueous gel of between about 0.1 and about 4.0 percent by weight of a fully hydrated carboxy vinyl polymer resin in the absence of an agent that gels said resin through neutralization, between about 0.1 and about 25 percent by weight finely divided particles of salicylic acid dispersed in said gel, and between 0.5 and about 25 percent by weight finely divided particles of benzoyl peroxide dispersed in said gel.

4,514,386
CREAM PREPARATION

Yoshiya Yamahira, Osaka; Katsuhiko Shima, Kobe; Chikako Matsusaka, Osaka, all of Japan, and Tetsuo Noguchi, Lawrence, Kans., assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 366,703, Apr. 8, 1982, abandoned. This application Dec. 6, 1983, Ser. No. 558,571
Claims priority, application Japan, Apr. 14, 1981, 56-564494
Int. Cl.³ A01U *31/78*
U.S. Cl. 424—81 10 Claims

1. A cream preparation which consist essentially of a pharmacologically active antiinflammatory substance which is hardly soluble in water in a base composition comprising 1 to 25 parts by weight of a medium chain fatty acid triglyceride of which the fatty acid has 6 to 12 carbon atoms, 0.3 to 3 parts by weight of a carboxypolymethylene and 75 to 99 parts by weight of purified water with an adjusted pH of 4 to 10, based on the weight of the base composition.

4,514,387
CHEMOKINESINS AND CHEMOTAXINS OF LEUKOCYTES AND INFLAMED TISSUES

Josef H. Wissler, Bad Nauheim, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,097
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110610
Int. Cl.³ A61K *39/395, 37/02;* C07G *7/00;* C12P *21/00*
U.S. Cl. 424—85 46 Claims

1. Leukocyte derived chemokinesins and chemotaxins, characterized by the following properties:

(a) biological activities in vivo and in vitro:

selective reversible influence on the motility of leukocytes (chemokinesis) or selective chemical attraction of leukocytes (chemotaxis) in vitro;

(b) physico-chemical properties:

soluble in aqueous media including in 15% ethanol at a pH value of at least 4.0 to 10;

insoluble in ammonium sulfate solution at 90% saturation (3.6 mol/l)

electrophoretic migration in acrylaminde matrices at a pH of 7.40 is anodic.

they adsorb reversibly in structure and biological activity on anion and cation exchangers, calcium phosphate gel and hydroxyapatite and can be subjected in native form to volume partition chromatography.

4,514,388
PROTEOLYTIC ENZYMES IN THE ZYMOGEN FORM TO TREAT SARCOMA CELLS

Nicholas G. Psaledakis, 1296 Middlesex St., Lowell, Mass. 01852

Continuation of Ser. No. 436,316, Mar. 22, 1983, abandoned. This application Jul. 27, 1983, Ser. No. 517,801
Int. Cl.³ A61K *37/54, 37/547*
U.S. Cl. 424—94 3 Claims

1. A method for the prophylatic treatment of sarcoma cancer tumor cells in a host body to prevent or at least reduce further development of said tumor cells comprising contacting said tumor cells with a proenzyme selected from the group consisting of trypsinogen, chymotrypsinogen and mixtures thereof in a concentration at least in excess of said proenzymes produced by the host body in the area of said tumor cells.

4,514,389
GASTRIC ANTACID AND METHOD FOR CONTROLLING PH OF GASTRIC JUICE

Shigeo Miyata, Takamatsu, Japan, assignor to Kyowa Chemical Industry Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 260,887, May 6, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 439,993
Int. Cl.³ A61K *33/42*
U.S. Cl. 424—128 9 Claims

1. A pharmaceutical composition comprising an amount, effective as an antacid, of a phosphate ion-containing hydrotalcite of the following formula

$$Mg_xAl_2(OH)_{2x+6-n1z1-n2z2}(A_1^{n1-})_{z_1}\cdot(A_2^{n2-})_{z2}\cdot mH_2O$$

wherein A_1^{n1-} represents at least one anion having a valence of n_1 selected from the group consisting of $H_2PO_4^-$ and HPO_4^{2-}, and PO_4^{-3}, A_2^{n2-} represents at least one anion having a valence of n_2 other than the $A_1^{n}{}_1^-$, selected from the group consisting of CO_3^{2-}, tartrate ion $(CHOHCOO)_2^{2-}$, salicylate ion $C_6H_5(OH)COO^-$, citrate ion $C_3H_4OH(COO)_3^{3-}$, glycine ion $NH_2CH_2COO^-$, glutamate ion $C_5H_7NO_4^{2-}$, cystine ion $C_3H_6NO_2S^-$, lactate ion $CH_3CHOHCOO^-$ and malate ion $CHOHCH_2(COO)_2^{2-}$, and x, z_1, z_2, and m are positive numbers satisfying the following expressions

$$2<x<40,$$

$$0.05\leqq z_1\leqq 2,$$

$$0.1\leqq z_2\leqq 2$$

$$0<m<40,$$

$$0.5\leqq z_1+z_2\leqq 2,$$

and a pharmaceutically acceptable diluent or carrier.

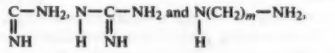
4,514,390
MELAMINYLTHIOARSENITES

Ernst A. H. Friedheim, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,562
Int. Cl.³ C07D *251/70;* C07F *9/80, 9/65;* A61K *31/53*
U.S. Cl. 514—184 18 Claims

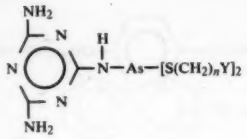
1. A compound represented by the formula

wherein Y is selected from the group consisting of NH_2,

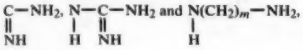


and n and m are both integers from 2 to 12 with the proviso that the value of n plus m is no more than 12, and the pharmaceutically acceptable acid addition salts thereof.

7. A composition useful for treating infections caused by trypanosomes or filaria comprising a pharmaceutically acceptable carrier and, as the principal active ingredient in an amount which is effective for treating such infections, a compound of the formula:



wherein Y is selected from the group consisting of NH_2,



and n and m are both integers from 2 to 12 with the proviso that the value of n plus m is no more than 12, and the pharmaceutically acceptable acid addition salts thereof.

4,514,391

HYDROXY SUBSTITUTED PEPTIDE COMPOUNDS

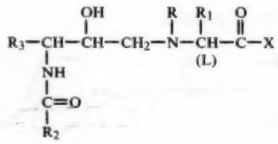
Eric M. Gordon, Pennington; Jollie D. Godfrey, Jr., Lawrenceville, and Sesha I. Natarajan, Neshanic Station, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 21, 1983, Ser. No. 515,729

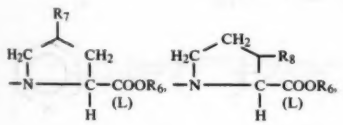
Int. Cl.[3] **A61K** *37/00*; **C07C** *103/52*

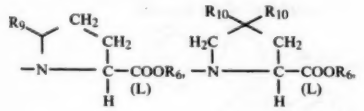
U.S. Cl. 514—2 **24 Claims**

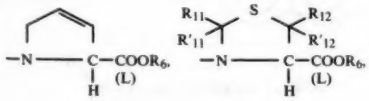
1. A compound of the formula

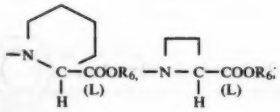


or a pharmaceutically acceptable salt thereof wherein X is

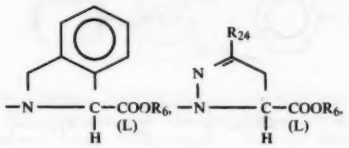


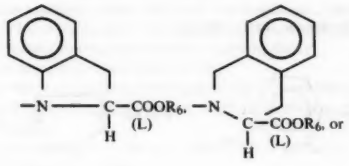


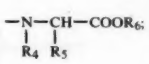




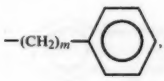
-continued







R is hydrogen, lower alkyl, cycloalkyl,



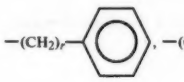
$-(CH_2)_3-NH_2$, $-(CH_2)_4-NH_2$,

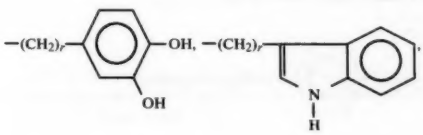
$-(CH_2)_2-OH$, $-(CH_2)_3-OH$,

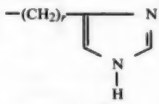
$-(CH_2)_4-OH$, $-(CH_2)_2-SH$,

$-(CH_2)_3-SH$, or $-(CH_2)_4-SH$;

R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,

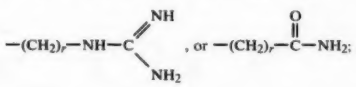




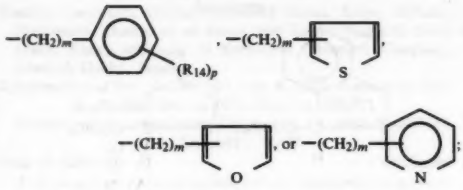


$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$,

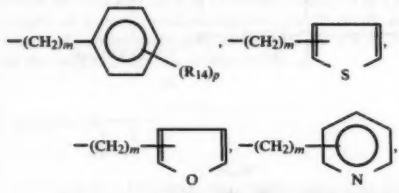
$-(CH_2)_r-S-$lower alkyl, $-(CH_2)_2-S-(CH_2)_2-NH_2$,



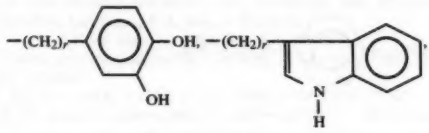
R_2 is



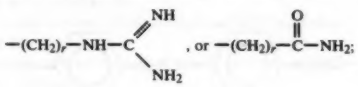
R_3 is hydrogen, lower alkyl,



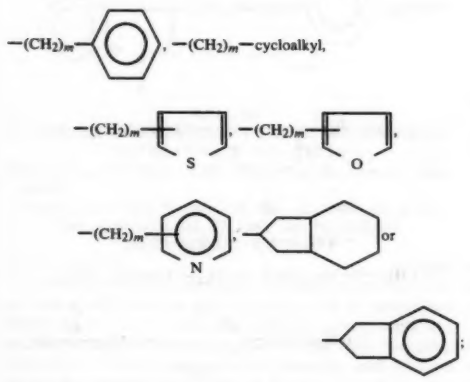
halo substituted lower alkyl, $-(CH_2)_m-$cycloalkyl,



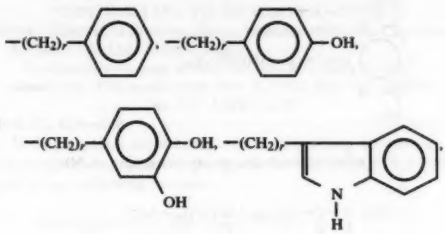
$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl,

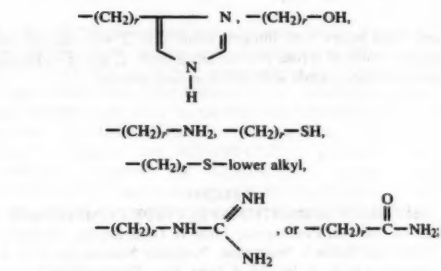


R_4 is hydrogen, lower alkyl,



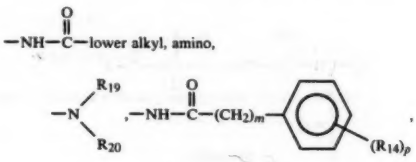
R_5 is hydrogen, lower alkyl,

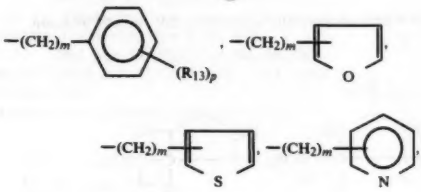




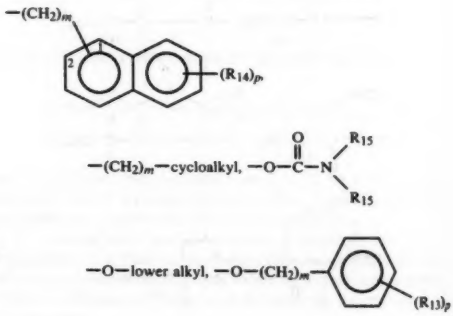
r is an integer from 1 to 4;

R_7 is hydrogen, lower alkyl, halogen, hydroxy,

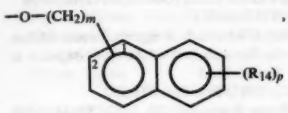




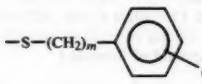
a 1- or 2-naphthyl of the formula



a 1- or 2-naphthyloxy of the formula

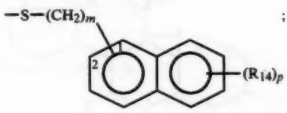


, —S—lower alkyl,



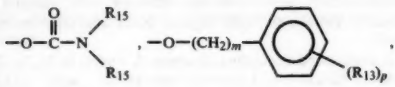
, or

a 1- or 2-naphthylthio of the formula



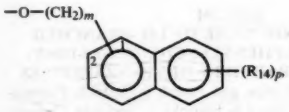
;

R_8 is halogen,

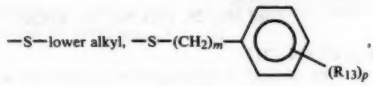


,

—O-lower alkyl, a 1- or 2-naphthyloxy of the formula

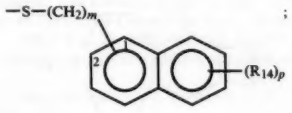


,



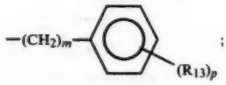
,

or a 1- or 2-naphthylthio of the formula



;

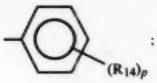
R_9 is keto or



;

R_{10} is halogen or —Y-R_{16};

R_{11}, R_{11}', R_{12} and R_{12}' are independently selected from hydrogen and lower alkyl or R_{11}', R_{12} and R_{12}' are hydrogen and R_{11} is



;

R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

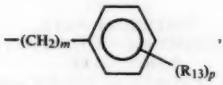
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y is oxygen or sulfur;

R_{16} is lower alkyl of 1 to 4 carbons,



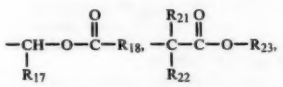
,

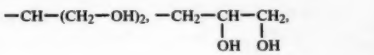
or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

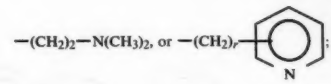
R_{19} is lower alkyl, benzyl, or phenethyl;

R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,



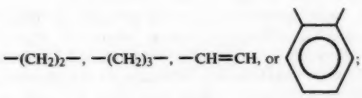




;

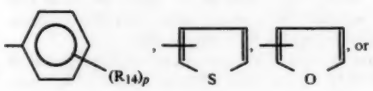
R_{17} is hydrogen, lower alkyl, cycloalkyl or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy, phenyl, or R_{17} and R_{18} taken together are



;

R_{24} is hydrogen, lower alkyl,



-continued

R_{21} and R_{22} are independently selected from the group consisting of hydrogen and lower alkyl; and
R_{23} is lower alkyl.

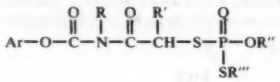
4,514,392

PESTICIDAL ARYL N-(ALKYLTHIO-PHOSPHOROTHIO)ACYL-N-ALKYL-CARBAMATES

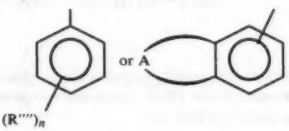
Themistocles D. J. D'Silva, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1983, Ser. No. 509,707
Int. Cl.³ A01N *57/12, 57/16;* **C07F** *9/165*
U.S. Cl. 514—148 **18 Claims**

1. Compounds having the structure:



wherein:
Q is oxygen or sulfur;
R is C_{1-4} alkyl;
R′ is hydrogen or C_{1-4} alkyl;
R″ is C_{1-6} alkyl;
R‴ is C_3–C_6 alkyl;
Ar is:



n is an integer having a value of zero to five;
each R⁗ is independently alkyl, halogen, alkoxy, haloalkoxy, aloxy-alkoxy, alkoxy-haloalkoxy, alkylthio, alkenyloxy, alkynyloxy, dialkylamino, alkylthioalkyl, 2-(1,3-dithiolanyl), 2-(1,3-oxathiolanyl) or 2-(1,3-dioxalanyl) substituents in any combination provided that no individual R⁗ may contain more than six aliphatic carbon atoms, and
A is a three or four membered, saturated or unsaturated, divalent chain composed of carbon atoms and not more than two oxygen or sulfur atoms wherein the carbon atoms of said chain may be substituted with one or more alkyl substituents containing no more than four carbon atoms each.

2. A method for controlling insects and mites comprised of subjecting them to a pesticidally effective amount of the compound of claim **1**.

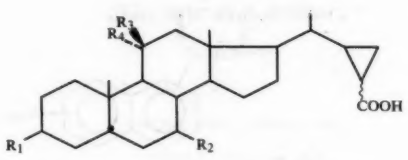
4,514,393

NEW DERIVATIVES OF BILIARY ACIDS, PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Virginio Castagnola, Milan; Giuliano E. Frigerio, Bresso-Milan, and Roberto Pellicciari, Perugia, all of Italy, assignors to Lehner AG, Muttenz, Switzerland

Filed Jul. 22, 1983, Ser. No. 516,251
Claims priority, application Italy, Jul. 29, 1982, 22632 A/82; Jul. 1, 1983, 21909 A/83
Int. Cl.³ A01N *45/00*
U.S. Cl. 260—397.1 **14 Claims**

1. A bilary acid compound of formula I



(I)

wherein R_1 and R_2 are an hydroxy group being α or β oriented; R_3 is hydrogen and R_4 is an hydroxy group or vice versa, or R_3 and R_4, taken together, form a keto group, and pharmaceutically acceptable salts thereof with alkaline or alkali-earth metals, or with organic bases and stereoisomers thereof.

2. A compound according to claim **1**, which is 3α,7α,12α-trihydroxy-5β-cholan-22,23-methanate-24-oic acid (22,23-methanate-cholic acid), (Ia).

8. Pharmaceutical composition characterized by containing as active principle the compound according to claim **2**.

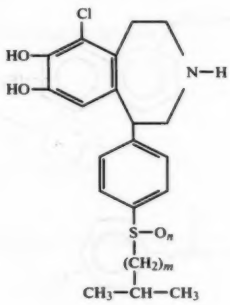
4,514,394

ANTI-HYPERTENSIVE USE OF 1-(4′-BRANCHED ALKYLSULFONYLPHENYL)-6-CHLORO-7,8-DIHYDROXY-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Pamela A. Chambers, Wayne, and Joseph Weinstock, Phoenixville, both of Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Filed May 25, 1983, Ser. No. 498,351
Int. Cl.³ A61K *31/55*
U.S. Cl. 514—213 **7 Claims**

1. The method of inducing anti-hypertensive activity in a subject in need thereof comprising administering orally or parenterally to said subject an anti-hypertensively effective, nontoxic quantity of a compound of the structural formula:



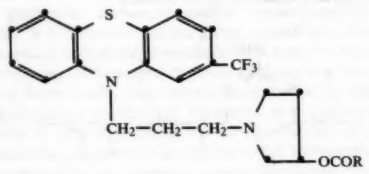
in which:
m is 0 or 1, and
n is 0 or 2, a pharmaceutically acceptable, acid addition salt or a di-C_{2-6}-alkanoyl ester derivative thereof.

4,514,395
PHENOTHIAZINE DERIVATIVES AND ANTI-PSYCHOTIC DRUGS CONTAINING THE SAME

Noriyasu Hirose, Tokyo; Shizuo Kuriyama, Saitama; Kiyomi Yamatsu, Kanagawa; Akifumi Kitahara, and Takeshi Uzuo, both of Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

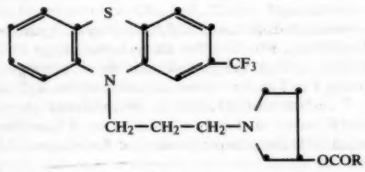
Filed Feb. 20, 1980, Ser. No. 123,008
Claims priority, application Japan, Feb. 22, 1979, 54-19052
Int. Cl.[3] A61K *31/54;* C07D *417/06*
U.S. Cl. 514—224 11 Claims

1. Phenothiazine derivatives having the general formula:



wherein R represents a straight or branched alkyl, alkenyl or aralkyl group having 5–15 carbon atoms and their pharmaceutically acceptable acid addition salts.

9. Anti-psychotic drugs which contains an anti-psychotically effective amount of a phenothiazine having the general formula:



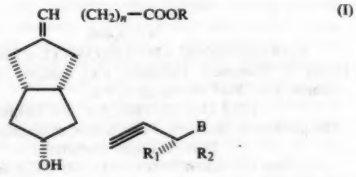
wherein R represents a straight or branched alkyl, alkenyl or aralkyl group having 5–15 carbon atoms or their pharmaceutically acceptable acid addition salts together with pharmaceutically acceptable excipients.

4,514,396
15-CYCLOALIPHATIC DERIVATIVES OF 13,14-DIDEHYDRO-CARBOPROSTACYCLINS AND PROCESS FOR THEIR PREPARATION

Nicola Mongelli, and Carmelo Gandolfi, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Sep. 28, 1983, Ser. No. 536,460
Claims priority, application United Kingdom, Oct. 1, 1982, 8228143
Int. Cl.[3] C07C *177/00;* A61K *31/557*
U.S. Cl. 514—222 14 Claims

1. An optionally active or racemic compound of the following formula (I)



(I)

wherein

R is hydrogen or a C_1–C_6 alkyl group optionally substituted by a group

wherein each of R_3 and R_4 is, independently, hydrogen or C_{1-C6} alkyl, or R_3 and R_4, taken together with the nitrogen atom to which they are linked, form a pentatomic or hexatomic heteromonocyclic ring optionally containing a further heteroatom chosen from O and S;

n is an integer of 1 to 5

one of R_1 and R_2 is hydrogen or C_114 C_6 alkyl and the other is hydroxy; and

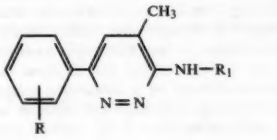
B represents: (a) a C_4–C_7 monocycloaliphatic group either unsubstituted or substituted by one or more substituents chosen from C_1–C_6 alkyl, C_2–C_6 alkylidene, (b) norbornyl; or (c) adamantyl, and the pharmaceutically or veterinarily acceptable salts thereof.

4,514,397
DERIVATIVES OF 4-METHYL 6-PHENYL PYRIDAZINE ACTIVE ON THE CENTRAL NERVOUS SYSTEM

Camille G. Wermuth, Strasbourg; Kathleen Bizière, Clapiers, and Horace Davi, St. Gely du Fesc, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 405,169, Aug. 4, 1982,. This application Oct. 19, 1983, Ser. No. 543,173
Claims priority, application France, Aug. 10, 1981, 81 15435
Int. Cl.[3] C07D *413/12, 237/14, 237/20;* A61K *31/50*
U.S. Cl. 514—247 6 Claims

1. Compounds of 4-methyl 6-phenyl pyridazine of formula:

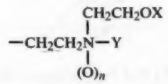


(I)

in which:

R is H or OH

R_1 represents the group



where n=0 or 1

and X and Y taken together form an ethylene or oxoethylene group, with the following conditions:

X+Y represents an ethylene group only when R represents OH and

n can be equal to 1 only if X+Y represents an ethylene group and the pharmaceutically acceptable acid additon salts thereof.

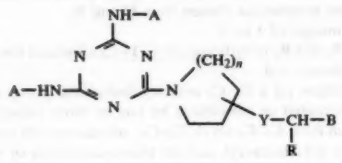
4,514,398

DISUBSTITUTED POLYMETHYLENE IMINES

Gilbert Regnier, Chatenay-Malabry; Alain Dhainaut, Chatou; Michel Laubie, Vaucresson, and Jacques Duhault, Croissy s/Seine, all of France, assignors to ADIR, Neuilly-sur-Seine, France

Filed Mar. 25, 1983, Ser. No. 478,715
Claims priority, application France, Mar. 30, 1982, 82 05373
Int. Cl.[3] C07D *401/04, 403/04;* A61K *31/53*
U.S. Cl. 514—245 8 Claims

1. A compound selected from the group consisting of: disubstituted polymethylene imines of the formula I:



(I)

in which:

A is selected from the group consisting of saturated hydrocarbon radicals containing from 3 to 5 carbon atoms inclusive in straight and branched chain, the corresponding unsaturated hydrocarbon radicals containing one and two double bonds, and the corresponding mono- and di-hydroxy (saturated and unsaturated hydrocarbon radicals,

n is selected from the group consisting of zero and the integers 1 and 2;

Y is selected from the group consisting of oxygen and a radical of the formula: N—R_1 in which R_1 is selected from the group consisting of hydrogen, alkyl and hydroxyalkyl each having from 1 to 5 carbon atoms inclusive, cycloalkyl and cycloalkenyl each having from 3 to 7 carbon atoms inclusive, and acetyl;

R is selected from the group consisting of: hydrogen, alkyl having from 1 to 5 carbon atoms inclusive, cycloalkyl having from 5 to 7 carbon atoms inclusive, unsubstituted phenyl and phenyl mono- and poly-substituted by a substituent selected from the group consisting of fluorine and chlorine; and

B is selected from the group consisting of:

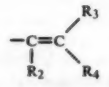
hydrogen,

alkyl having from 1 to 5 carbon atoms inclusive,

alkenyl having from 2 to 5 carbon atoms inclusive,

phenyl, naphthyl, benzofuranyl, benzothienyl, benzodioxolyl, benzodioxanyl, benzodioxinyl, Δ_3-chromenyl, thiochromenyl and chromanyl, and all these radicals mono- and poly-substituted by a substituent selected from the group consisting of fluorine and chlorine and alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, and

a radical of the formula:



in which R_2, R_3 and R_4 which are the same or different, are each selected from the group consisting of hydrogen, unsubstituted phenyl and phenyl mono- and poly-substituted by a substituent selected from the group consisting of chlorine and fluorine; and

physiologically tolerable acid addition salts thereof.

7. A pharmaceutical composition, suitable for use in the treatment of hypoxia, containing as active ingredient a compound of claim 1, in an amount effective for such purpose, together with a suitable pharmaceutical carrier.

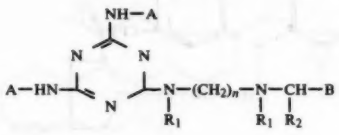
4,514,399

N-N'SUBSTITUTED POLYMETHYLENE DIAMINES

Gilbert Regnier, Chatenay Malabry; Alain Dhainaut, Chatou; Michel Laubie, Vaucresson, and Jacques Duhault, Croissy-Sur-Seine, all of France, assignors to Adir, Neuilly-sur-Seine, France

Filed Apr. 18, 1983, Ser. No. 486,013
Claims priority, application France, Apr. 21, 1982, 82 06813
Int. Cl.[3] C07D *251/70;* A61K *31/53*
U.S. Cl. 514—241 6 Claims

5. A pharmaceutical composition, suitable for use in the treatment of hypoxia, containing as active ingredient a compound selected from the group consisting of: N,N'-substituted polymethylene diamines of the formula I:



(I)

in which:

A is selected from the group consisting of: saturated hydrocarbon radicals containing 3 to 5 carbon atoms inclusive, in straight and branched chain, the corresponding unsaturated hydrocarbon radicals containing one and two double bonds, and the corresponding mono- di-hydroxy (saturated and unsaturated) hydrocarbon radicals;

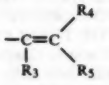
n is selected from the group consisting of the integers 2 to 6 inclusive;

R_1 is selected from the group consisting of: hydrogen and alkyl having 1 to 5 carbon atoms inclusive;

R_2 is selected from the group consisting of: hydrogen, alkyl having 1 to 5 carbon atoms inclusive, cycloalkyl having 5 to 7 carbon atoms inclusive, unsubstituted phenyl and phenyl mono- and poly-substituted by a substituent selected from the group consisting of fluorine and chlorine; and

B is selected from the group consisting of: phenyl, naphthyl, benzofuranyl, benzothienyl, benzodioxolyl, benzodioxanyl, benzodioxinyl, 3-chromenyl, thiochromenyl and chromanyl and each of these radicals mono- and poly-substituted by a substituent selected from the group consisting of fluorine and chlorine, alkyl and alkoxy each having 1 to 5 carbon atoms inclusive, and methylene dioxy; and

a radical of the formula:



in which: R_3, R_4 and R_5, which may be the same or different, are each selected from the group consisting of hydrogen, unsubstituted phenyl and phenyl mono- and poly-substituted by a substituent selected from the group consisting of chlorine and fluorine; and physiologically tolerable acid addition salts thereof, in an amount effective for such purpose, together with a suitable pharmaceutical carrier.

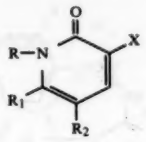
4,514,400

CARDIOTONIC 5-HETEROARYL-PYRIDONE

Henry F. Campbell, Lansdale, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Oct. 26, 1981, Ser. No. 314,692
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.[3] A61K *31/495, 31/505;* C07D *401/00*
U.S. Cl. 514—252 11 Claims

1. A compound having the formula:



wherein X is selected from the group consisting of hydrogen, alkyl, cyano, halogen, trifluoromethyl, alkoxy, hydroxy, hydroxyloweralkyl, amino, alkylamino, dialkylamino, acylamino, ureido, guanidino, carbamylguanidino, cyanoguanidine or thioureido; R is selected from the group consisting of hydrogen, loweralkyl or hydroxyloweralkyl; R_1 is selected from the group consisting of hydrogen or loweralkyl; R_2 is a nitrogen containing heterocyclic ring selected from the group consisting of pyrimidinyl, pyridazinyl, pyrazinyl, or a pyrimidinyl, pyridazinyl or pyrazinyl having one or more substituents selected from the group consisting of loweralkyl, hydroxyloweralkyl, hydroxyl, alkoxy, alkanoyl, amino, alkylamino or dialkylamino, and the pharmaceutically acceptable salts thereof.

4,514,401

CARBOSTYRIL DERIVATIVES

Michiaki Tominaga; Yung-hsiung Yang; Hidenori Ogawa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

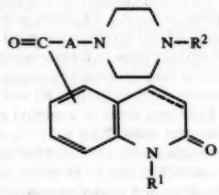
Continuation of Ser. No. 265,501, May 20, 1981, abandoned. This application Aug. 11, 1982, Ser. No. 407,099

Claims priority, application Japan, Sep. 1, 1981, 56-137984; Dec. 25, 1981, 56-210368

Int. Cl.³ C07D *215/00;* A61K *31/47*

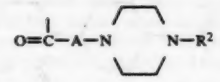
U.S. Cl. 514—253 **17 Claims**

1. A carbostyril derivative or a pharmaceutically acceptable salt thereof, said derivative being represented by the formula (I),



(I)

wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; R^2 is a lower alkanoyl group, a lower alkoxycarbonyl group, a furoyl group, a lower alkane-sulfonyl group, a benzoyl group (which benzoyl group may have (a) 1 to 3 substituents on the phenyl ring selected from the group consisting of a lower alkyl group, a lower alkoxy group, a halogen atom, and an amino group, (b) 1 substituent on the phenyl ring selected from the group consisting of a nitro group and a cyano group or (c) a lower alkylenedioxy group as the substituent on the phenyl ring), a phenyl-lower alkenylcarbonyl group (which may have 1 to 3 lower alkoxy groups as the substituents on the phenyl ring), a phenoxy-lower alkyl group, or a phenylsulfonyl group (which may have a lower alkyl group as the substituent on the phenyl ring); A is a lower alkylene group; the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single or double bond; and the substituted position of the side-chain of the formula,



may be any one of the 5-, 6-, 7- or 8-positions in the carbostyril skeleton.

4,514,402

MIXTURE OF FUNGICIDAL AGENTS

Wilhelm Brandes, Leichlingen; Helmut Kaspers, Leverkusen; Paul Reinecke, Leverkusen; Hans Scheinpflug, Leverkusen, and Wolfgang Krämer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

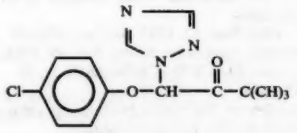
Filed Feb. 22, 1983, Ser. No. 468,729

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208142

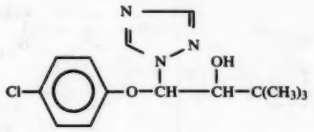
Int. Cl.³ A01N *43/48, 43/64*

U.S. Cl. 514—250 **4 Claims**

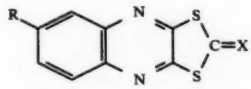
1. A fungicidal composition comprising a fungicidally effective amount of compound I selected from the group consisting of



and



and an approximately equal weight of compound II selected from the group consisting of a quinoxaline derivative of the formula



wherein for compound (IIa), R is $-CH_3$ and X is O and wherein for compound (IIb), R is H and X is S.

4,514,403

HYDROURACIL COMPOUNDS

Chiaki Tashiro, Fukuoka; Takeshi Kawakita, Oita; Ichiro Horii, Fukuoka, and Koretake Anami, Oita, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Japan

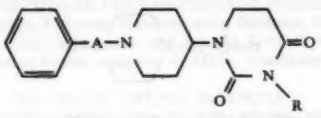
Filed Sep. 17, 1981, Ser. No. 303,269

Claims priority, application Japan, Sep. 17, 1980, 55/129816

Int. Cl.³ A61K *31/505;* C07D *401/04*

U.S. Cl. 514—274 **6 Claims**

1. A hydrouracil compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein A represents —CH=CH—CH_2— or —CH_2CH_2—, and R represents hydrogen or methyl.

6. A pharmaceutical composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

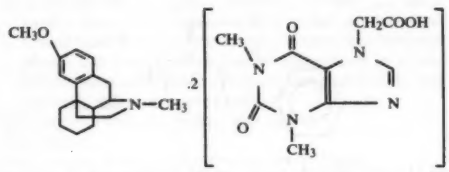
4,514,404

PROCESS FOR OBTAINING COMPLEX OF 3-METHOXY-N-METHYLMORPHINAN WITH 7-THEOPHYLLINEACETIC ACID (1:2)

Dagmar V. Veit, Barcelona, Spain, assignor to Prodes, S.A., Barcelona, Spain

Filed Nov. 17, 1983, Ser. No. 552,677
Claims priority, application Spain, Nov. 19, 1982, 517.500
Int. Cl.³ C07D *473/04;* A61K *31/52*
U.S. Cl. 514—265 **5 Claims**

3. A complex of 3-methoxy-N-methylmorphinan with 7-theophyllineacetic acid having the formula



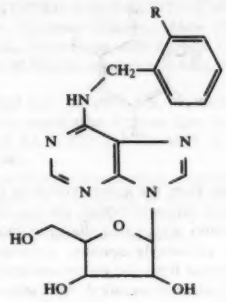
4,514,405

USE OF ADENOSINE DERIVATIVES AS ANTICONVULSANTS

Klaus Irmscher, Darmstadt, and Jürgen Uhl, Seeheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 303,295, Sep. 17, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 573,178
Int. Cl.³ A61K *31/52, 31/70*
U.S. Cl. 514—46 **14 Claims**

1. A method of achieving an anticonvulsant effect in a patient suffering from an indication which can be treated by achieving such an effect, which comprises administering to such a patient an amount of a compound of the formula



I

wherein R is H, F, Cl, Br or CF_3 or a physiologically acceptable acid addition salt thereof, effective to achieve an anticonvulsant effect in the patient which relieves the indication.

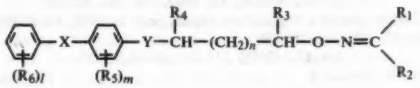
4,514,406

OXIME ETHERS AND THEIR USE

Tadashi Ohsumi, Funabashi; Makoto Hatakoshi, Minoo, and Hirosi Kisida, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 16, 1983, Ser. No. 466,905
Claims priority, application Japan, Mar. 4, 1982, 57-34553
Int. Cl.³ A01N *43/40, 33/24;* C07C *131/00*
U.S. Cl. 514—352 **24 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are, same or different, each a hydrogen atom, a C_1–C_3 alkyl group optionally substituted with halogen, an alkoxyalkyl or alkylthioalkyl group of the formula: R_7—Z—$(CH_2)_q$—, a C_2–C_3 alkenyl group, a C_2–C_4 alkynyl group, a C_1–C_2 alkoxy group, a C_1–C_2 alkylthio group, a phenyl group, a pyridyl group, a furyl group or a thienyl group, or R_1 and R_2 may be combined together to form a saturated or unsaturated 5- or 6-membered ring optionally having not more than 2 oxygen or sulfur atoms within the ring, R_3 and R_4 are, same or different, each a hydrogen atom or a methyl group, R_5 is a methyl group or a halogen atom, R_6 is a C_1–C_4 alkyl group, a methoxy group, a halogen atom, a trifluoromethyl group or a nitro group, R_7 is a methyl group or an ethyl group, X is an oxygen atom, a sulfur atom or a methylene group, Y and Z are each an oxygen atom or a sulfur atom, l is an integer of 0 to 5, m is an integer of 0 to 4, n is an integer of 0 to 2 and q is an integer of 1 or 2.

12. A composition for controlling insects which comprises as an active ingredient an insecticidally effective amount of the compound according to claim 1 and an inert carrier or diluent.

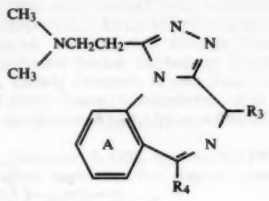
4,514,407

1-ETHANAMINE-TRIAZOLO-BENZODIAZEPINES AS DIURETICS

Jackson B. Hester, Jr., Comstock Township, Kalamazoo County, and James H. Ludens, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 17, 1983, Ser. No. 476,181
Int. Cl.³ A61K *31/55;* C07D *487/04*
U.S. Cl. 514—220 **16 Claims**

1. A process for inducing diuresis in a warm-blooded animal patient which comprises administering to such patient a safe, non-toxic, effective amount of a compound of the Formula I



I

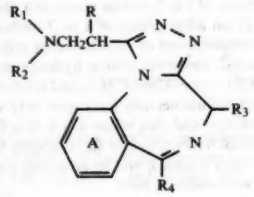
wherein

R_3 is hydrogen or C_1 to C_3-alkyl;

R_4 is phenyl or 2-, 3-, or 4-pyridinyl;

ring A is substituted by one or more fluorine, bromine, iodine, C_1 to C_3-alkyl, hydroxy, C_1 to C_3-alkyloxy, C_1 to C_3-alkylthio, amino, C_1 to C_3-alkylamino, di(C_1 to C_3-alkyl)amino, trifluoromethyl, or nitro;

or of a compound of the Formula II



II

wherein

R is phenyl substituted by zero to two methoxy or ortho-chlorine groups;

R_1 and R_2 are independently hydrogen or C_1 to C_3-alkyl;

R_3 is hydrogen or C_1 to C_3-alkyl;

R_4 is phenyl or 2-, 3-, or 4-pyridinyl;

ring A is substituted by one or more fluorine, chlorine, bromine, iodine, C_1 to C_3-alkyl, hydroxy, C_1 to C_3-alkyloxy, C_1 to C_3-alkylthio, amino, C_1 to C_3-alkylamino, di(C_1 to C_3-alkyl)amino, trifluoromethyl, or nitro;

or a pharmaceutically acceptable salt thereof.

16. A method for treating hypertension in a warm-blooded animal patient which comprises administering to said patient an amount effective to lower blood pressure of a compound of Formula I or II of claim **1**.

4,514,408

N-SUBSTITUTED NICOTINAMIDE 1-OXIDE AS HISTAMINE H_2 RECEPTOR BLOCKERS

Dino Nisato, Pavia, and Sergio Boveri, Tortona, both of Italy, assignors to Sanofi, Paris, France

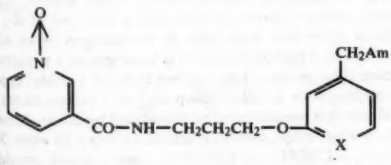
Filed Aug. 12, 1983, Ser. No. 522,749

Claims priority, application France, Aug. 13, 1982, 82 14128; Apr. 22, 1983, 83 06681

Int. Cl.[3] **A61K** *31/455;* **C07D** *401/12*

U.S. Cl. 514—212 **7 Claims**

1. A N-substituted nicotinamide 1-oxide of formula



wherein X represents a nitrogen atom or a CH group; Am represents an amino group substituted by lower alkyl, lower alkyl bearing a hydroxy or phenyl group or a cycloalkyl group of from 3 to 6 carbon atoms, or by a radical selected from the group consisting of lower alkenyl, lower alkynyl, phenyl and cycloalkyl of from 3 to 6 carbon atoms; an amino group substituted by two identical or different lower alkenyl or lower alkynyl groups; an amino group substituted by two identical or different (hydroxy)lower alkyl or (lower alkoxy)lower alkyl groups; a lower dialkylamino group; a lower dialkylamino group substituted by a phenyl, cycloalkyl of from 3 to 6 carbon atoms, methoxy or hydroxy group; a pyrrolidino group; a morpholino group; a thiomorpholino group; a hexamethyleneimino group; a piperidino group; a piperidino group substituted by a methyl, hydroxy or hydroxymethyl group or by two methyl groups; a piperazino group substituted in the 4-position by a lower alkyl group or a (hydroxy)lower alkyl group; a piperazino group substituted in the 4-position by a lower alkyl group or a (hydroxy)lower alkyl group and also bearing a methyl group in the 3- and/or 5-position; or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition in dosage unit form having histamine H_2-blocking action comprising from 10 to 1000 mg of a compound as claimed in one of claims **1** to **5** in admixture with a pharmaceutical carrier.

4,514,409

COMBATING FUNGI WITH NOVEL 5-ARYLOXY-5-AZOLYL-3,3-DIMETHYLPENT-1-EN-4-ONES AND -OLS

Gerhard Jäger, Leverkusen; Manfred Jautelat; Karl H. Büchel, both of Burscheid; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

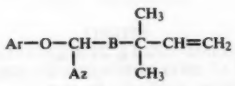
Filed Jul. 14, 1982, Ser. No. 398,028

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130435

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *233/60, 249/08*

U.S. Cl. 514—383 **10 Claims**

1. A 5-aryloxy-5-azolyl-3,3-dimethylpent-1-en-4-one or -ol of the formula



in which

Ar is a phenyl group or a phenyl group substituted by at least one substituent selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxycarbonyl having 1 to 4 carbon atoms in the alkyl part, nitro, cyano or phenyl which is optionally substituted by halogen and/or alkyl having 1 or 2 carbon atoms.

Az is a 1,2,4-triazol-1-yl, 1,2,4-triazol-4-yl or imidazol-1-yl group, and

B is a keto group or a CH(OH) grouping, or an addition product thereof with a physiologically acceptable acid or a metal salt.

9. A method of combating fungi comprising applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound or addition product according to claim **1**.

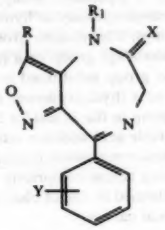
4,514,410

SUBSTITUTED 8-PHENYLISOXAZOLO[4,3-e][1,4]DIAZEPIN-5-ONES

John J. Tegeler, Bridgewater, and Craig J. Diamond, Budd Lake, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed May 31, 1984, Ser. No. 615,857
Int. Cl.[3] A61K *31/55;* C07D *498/04, 261/14*
U.S. Cl. 514—221 73 Claims

1. A compound having the formula



wherein R is lower alkyl; R_1 is hydrogen, propargyl, amino lower alkyl and lower alkyl; X is oxygen and sulfur; and Y is halogen, trifluoromethyl, lower alkyl, lower alkoxy and hydrogen; and the pharmaceutically acceptable acid addition salts thereof.

4,514,411

SUBSTITUTED 4,10-DIHYDRO-10-OXOTHIENO BENZOXEPINS

Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 474,218, Mar. 10, 1983, Pat. No. 4,477,465.
This application Aug. 10, 1984, Ser. No. 639,548
Int. Cl.[3] A61K *31/42;* C07D *495/04*
U.S. Cl. 514—215 4 Claims

1. The compound which is 2-(4,10-dihydro-10-oxothieno[3,2-c][1]benzoxepin-8-yl)methyl-4,4-dimethyloxazoline or a pharmaceutically acceptable salt thereof.

2. An anti-inflammatory or an analgesic composition which comprises an effective anti-inflammatory or pain alleviating amount of 2-(4,10-dihydro-10-oxothieno[3,2-c][1]benzoxepin-8-yl)-methyl-4,4-dimethyloxazoline or a pharmaceutically acceptable salt thereof.

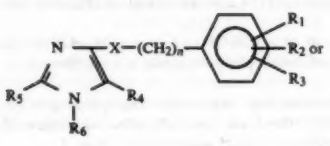
4,514,412

SUBSTITUTED IMIDAZOLE DERIVATIVES AND THEIR USE AS ANTI-THROMBOSIS AGENTS

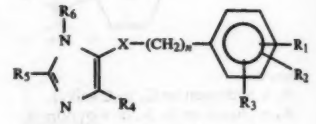
Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos Yhtyma Oy, Turku, Finland

Filed Feb. 3, 1982, Ser. No. 345,548
Claims priority, application United Kingdom, Feb. 5, 1981, 8103620
The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.
Int. Cl.[3] A61K *31/415;* C07D *233/54, 233/66*
U.S. Cl. 514—397 29 Claims

1. A substituted imidazole of the formula:

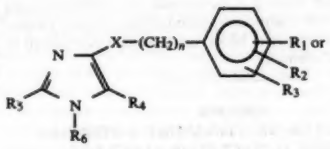


-continued

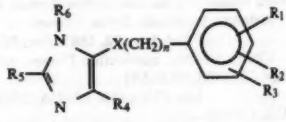


wherein each of R_1, R_2 and R_3, which can be the same or different, is hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro and at least one of R_1, R_2 and R_3 is other than hydrogen; R_4 is hydrogen or an alkyl radical of 1 to 7 carbon atoms; R_5 is hydrogen or a straight or branched alkyl group of 1 to 5 carbon atoms or a phenyl group; R_6 is hydrogen or an alkyl group of 1 to 7 carbon atoms or benzyl which is unsubstituted or substituted by chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro; X is —CH_2—, —CHOH— or —CH=CH—; and n is 0–4, provided that R_5 and R_6 are simultaneously hydrogen only when n is 4 and X is —CH=CH— and that when n is 2, X is CHOH, R_1, R_2, R_4 and R_5 are all hydrogen, and R_6 is methyl, then R_3 is a substituent other than 2-amino; and its nontoxic, pharmaceutically acceptable acid addition salts.

3. A method of reducing and preventing thrombosis which comprises administering to a patient subject thereto an effective amount of a compound selected from the glass consisting of a substituted imidazole of the formula:



(I)



wherein each of R_1, R_2 and R_3, which can be the same or different, is hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro and at least one of R_1, R_2 and R_3 is other than hydrogen; R_4 is hydrogen or an alkyl radical of 1 to 7 carbon atoms; R_5 is hydrogen or a straight or branched alkyl group of 1 to 5 carbon atoms or a phenyl group, R_6 is hydrogen or an alkyl group of 1 to 7 carbon atoms or benzyl which is unsubstituted or substituted by chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy, or nitro; X is —CH_2—, —CHOH— or CH=CH—; and n is 0–4, provided that R_5 and R_6 are simultaneously hydrogen only when n is 4 and X is —CH=CH—; and its non-toxic pharmaceutically acceptable acid addition salts.

4,514,413
GASTRIC ACID SECRETION INHIBITING N-(IMIDAZOL-1-YLALKYL)THIOUREA DERIVATIVES

Bernd Ostersehlt, Ludwigshafen; Albrecht Franke, Wachenheim; Fritz-Frieder Frickel, Deidesheim; Marco Thyes, Ludwigshafen; Ludwig Friedrich, Bruehl; Josef Gries, Wachenheim, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

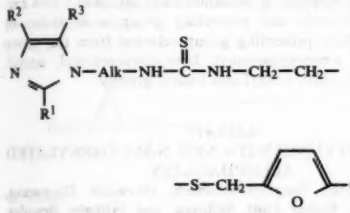
Filed Apr. 7, 1983, Ser. No. 482,790

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213509

Int. Cl.³ A61K *31/415;* C07D *233/61*

U.S. Cl. 514—397 7 Claims

1. An N-substituted imidazole derivative of the formula I



where R^1, R^2 and R^3 are identical or different and are each hydrogen or alkyl of 1 to 3 carbon atoms and Alk is an alkylene chain of 2 to 4 carbon atoms, and its salts with physiologically tolerated acids.

7. A composition for treating disorders associated with gastric hyperacidity which comprises a pharmaceutically acceptable carrier and/or diluent and an amount of a compound of the formula I as set forth in claim 1, effective to inhibit the secretion of gastric acid, or one of its physiologically tolerated salts.

4,514,414
N-SUBSTITUTED PYRROLIDINEACETIC ACIDS AND THEIR ESTERS

William E. Bondinell, Cherry Hill, N.J.; John J. Lafferty, Levittown, and Charles L. Zirkle, Berwyn, both of Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Filed Oct. 25, 1982, Ser. No. 436,232

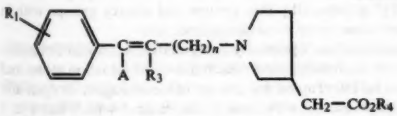
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ A61K *31/40;* C07D *207/08*

U.S. Cl. 514—422 6 Claims

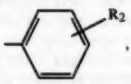
1. A compound represented by one of the formulas:

FORMULA I



wherein:

A is



2-thienyl, 3-thienyl or cyclohexyl;

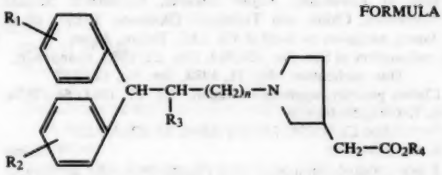
R_1 and R_2, which are the same or different, are hydrogen, fluorine, chlorine, methyl or methoxy;

R_3 is hydrogen or methyl;

n is a positive whole integer 2 or 3; and

R_4 is hydrogen or lower alkyl of from 1 to 3 carbon atoms;

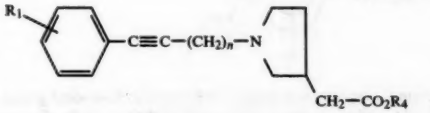
FORMULA II



wherein:

R_1, R_2, R_3, R_4 and n are as defined above for formula I; and

FORMULA III



wherein:

R_1, R_4 and n are as defined above for formula I or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition for inhibiting GABA uptake in dosage unit form comprising a pharmaceutical carrier and an amount sufficient to produce said inhibition of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,514,415
BENZOFURAN-2(3H)-ONES USED AS ANTI-INFLAMMATORY AGENTS

Paul Wenk, Allschwil; Werner Breitenstein, and Marcus Baumann, both of Basel, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

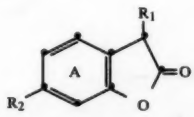
Filed Oct. 21, 1982, Ser. No. 435,594

Claims priority, application Switzerland, Oct. 28, 1981, 6881/81

Int. Cl.³ C07D *307/83;* A61K *31/365*

U.S. Cl. 514—470 11 Claims

1. A benzofuranone of the formula



(I)

in which R_1 represents hydrogen or lower alkyl, R_2 represents an amino group di-substituted by two lower alkyl groups which are unsubstituted or substituted by 3- to 7-membered cycloalkyl, by unsubstituted phenyl or by phenyl substituted by lower alkyl, lower alkenyl, lower alkylene, hydroxy-lower alkyl, halogeno-lower alkyl, lower alkoxy, lower alkylthio, lower alkanesulphinyl, lower alkanesulphonyl, hydroxy, halogen, lower alkanoyloxy, lower alkanoyl and/or nitro, and the aromatic ring A is unsubstituted or additionally substituted by lower alkyl, hydroxy-lower alkyl, halogeno-lower alkyl, lower alkenyl, 3- to 4-membered alkylene having 3 to 8 carbon atoms, lower alkoxy, lower alkylthio, lower alkanesulphinyl, lower alkanesulphonyl, hydroxy, halogen, lower alkanoyloxy, lower alkanoyl and/or nitro, or a pharmaceutically acceptable salt or tautomer thereof.

4,514,416

AMIDINE COMPOUND, PROCESS FOR PRODUCING SAME AND ANTI-COMPLEMENT AGENT COMPRISING SAME

Setsuro Fujii, Toyonaka; Takashi Yaegashi; Toyoo Nakayama, both of Funabashi; Yojiro Sakurai, Kamakura; Shigeki Nunomura, Chiba, and Toshiyuki Okutome, Tokyo, all of Japan, assignors to Torii & Co. Ltd., Tokyo, Japan

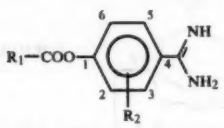
Continuation of Ser. No. 350,963, Feb. 22, 1982, abandoned. This application May 21, 1984, Ser. No. 611,937

Claims priority, application Japan, Feb. 27, 1981, 56-27974; Sep. 7, 1981, 56-140650

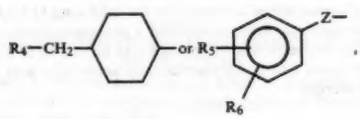
Int. Cl.[3] **C07C** *119/00*; **A61K** *31/22, 31/235*

U.S. Cl. 549—442 **7 Claims**

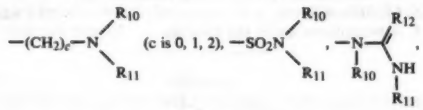
1. An amidino compound or a pharmaceutically acceptable acid addition salt thereof, said amidino compound being represented by the formula



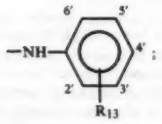
wherein R_1 represents a straight or branched chain alkyl group of 1 to 6 carbon atoms, a straight or branched chain alkenyl group of 2 to 6 carbon atoms including 1 to 3 double bonds, $R_3—(CH_2)_a—$, $R_4(CH_2)_b—$,



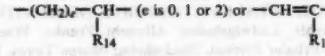
where R_3 is cycloalkyl group of 3 to 6 carbon atoms or cycloalkenyl group of 3 to 6 carbon atoms including 1 to 2 double bonds; a is 0, 1, 2 or 3; R_4 is amino or guanidino group possessing radical protecting group or not; b is a number of 1 to 5; R_5 and R_6, which may be the same or different, are each a hydrogen atom, straight or branched alkyl group of 1 to 4 carbon atoms, $—OR_7$, methylenedioxy group, $—SR_7$, $—COOR_7$, $—COR_8$, $—OCOR_9$, $—NHCOR_9$,



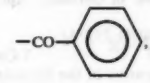
NO_2, CN, halogen atom, $—CF_3$ or



R_7 is hydrogen atom, straight or branched alkyl group of 1 to 4 carbon atoms or benzyl group; R_8 is hydrogen atom, straight or branched alkyl group of 1 to 4 carbon atoms; R_9 is straight or branched alkyl group of 1 to 4 carbon atoms; R_{10} and R_{11}, which may be the same or different, are each a hydrogen atom, straight or branched alkyl group of 1 to 4 carbon atoms, or amino radical protecting group R_{12} is O, S or NH; R_{13} is 2',3'-dimethyl or 3'-CF_3 group; Z is $—(CH_2)_d—$(d is 0, 1, 2 or 3),



R_{14} is straight or branched alkyl group of 1 to 4 carbon atoms; R_{15} is hydrogen atom, straight or branched alkyl group of 1 to 4 carbon atoms; R_2 represents $—OR_{16}$, NO_2 or



wherein R_{16} is straight or branched alkyl group of 1 to 4 carbon atoms; wherein said protecting group is an amino or guanidino radical protecting group selected from the group consisting of t-butoxycarbonyl, benzyloxycarbonyl, acetyl, benzoyl, tosyl, nitro, benzyl and t-butyl groups.

4,514,417

COMBATING FUNGI WITH NEW N-SULPHENYLATED ALLOPHANATES

Engelbert Kühle, Bergisch-Gladbach; Hermann Hagemann, Leverkusen; Volker Paul, Solingen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

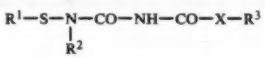
Filed Dec. 7, 1981, Ser. No. 328,318

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049440

Int. Cl.[3] **C07C** *83/10*; **A01N** *37/00*

U.S. Cl. 514—482 **8 Claims**

1. A N-sulphenylated allophanate of the formula



in which

R^1 represents trichloromethyl or fluorodichloromethyl,

R^2 represents an optionally halogenated, saturated or unsaturated aliphatic radical which has up to 6 carbon atoms and can optionally be interrupted by one or more nitrogen and oxygen atoms; a cycloaliphatic radical with 5 to 8 carbon atoms; a lower hydrocarbyl araliphatic radical which has 7 to 10 carbon atoms and of which the aromatic part can optionally carry cyano groups, nitro groups, trifluoromethyl groups, alkyl and alkoxy groups with up to 4 carbon atoms; or a phenyl radical which can optionally carry one or more substituents selected from halogen, nitro groups, cyano groups, trifluoromethyl groups and alkyl groups, alkylthio groups and alkoxy groups with in each case up to 4 carbon atoms, and

R^3 represents an optionally halogenated, saturated or unsaturated aliphatic radical which has up to 8 carbon atoms and can be interrupted by one or more nitrogen, oxygen and sulphur atoms; a cycloaliphatic radical which has 5 to 7 carbon atoms and is optionally substituted by alkyl with up to 4 carbon atoms; a phenylalkyl radical of which the phenyl part can optionally carry one or more substituents selected from halogen, cyano groups, nitro groups, trifluoromethyl groups and alkyl groups, alkylthio and alkoxy groups with in each case up to 4 carbon atoms; or a phenyl radical which can optionally carry one or more substituents selected from halogen, nitro groups, cyano groups, trifluoromethyl groups and alkyl groups, alkylthio groups and alkoxy groups with in each case up to 4 carbon atoms, and

X represents oxygen or sulphur.

7. A method of combating fungi comprising applying to the

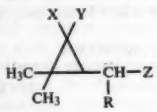
fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,514,418
2,2-DIHALOGENO-3,3-DIMETHYLCYCLOPROPANE DERIVATIVE FUNGICIDES

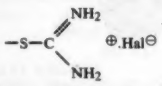
Junichi Saito, Mitaka, and Shinzo Kagabu, Hachioji, both of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Apr. 8, 1983, Ser. No. 483,410
Claims priority, application Japan, Apr. 20, 1982, 57-64701
Int. Cl.³ A01N *37/00, 47/46, 41/02;* **C07C** *69/00*
U.S. Cl. 514—508 **13 Claims**

1. A 2,2-dihalogeno-3,3-dimethylcyclopropylmethyl derivative of the formula



in which
X and Y each independently is halogen,
R is a hydrogen atom or a methyl group,
Z is a cyano group, a thiocyano group, a group of the formula



or a group of the formula

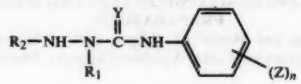
Hal is a halogen atom,
n is 0 or 1, and
Q is a lower alkyl group, a halo-lower alkyl group, a phenyl group, or a phenyl group substituted by at least one of halogen, lower alkyl and nitro.

4,514,419
NEMATICIDAL USE OF HYDRAZINECARBOXAMIDES AND CARBOTHIOAMIDES

Philip A. Cruickshank, Princeton; Carmine P. DiSanzo, Lawrenceville, both of N.J.; Kiyosi Kondo, Kanagawa, and Hiromichi Kono, Yamaguchi, both of Japan, assignors to FMC Corporation and Kanagawa Chemical Laboratory, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 375,424, May 6, 1982, abandoned. This application May 18, 1983, Ser. No. 495,859
Int. Cl.³ A01N *33/26*
U.S. Cl. 514—521 **18 Claims**

1. A method of controlling nematodes which comprises applying to or incorporating into nematode-infested soil a nematicidally effective amount of a nematicidal composition including in admixture with an agriculturally acceptable carrier at least one nematicidal compound of the formula



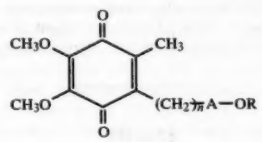
wherein
R_2 is H or CH_3,
Y is S or O,
n is 0–5,
Z is substituted for H and independently selected from F, Cl, Br, CH_3, C_2H_5 (when R_2 is H), CF_3, NO_2, and phenoxy, and either
(1) R_1 is CH_3, with the provisos that when Y is S and n=1, Z is not 3-Cl if R_2 is CH_3; no more than one Z may be C_2H_5; when Y is O and n=2, Z is not 3-Cl and 5-Cl; and no more than one Z may be Br if R_2 is CH_3; or
(2) R_1 is C_2H_4OH or C_2H_4CN, with the provisos that when Y=O and n=1, Z is not 4-Cl or 4-Br; and when n=2, Z is not 3-Cl and 4-Cl.

4,514,420
ANTIFIBROTIC AGENT

Isuke Imada, Izumi, and Masazumi Watanabe, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 25, 1983, Ser. No. 479,074
Claims priority, application Japan, Apr. 6, 1982, 57-57474
Int. Cl.³ A61K *31/12, 31/19, 31/215*
U.S. Cl. 514—689 **10 Claims**

1. A method for treatment of a mammal suffering from fibrosis due to excessive collagen accumulation, which comprises administering to the mammal an effective amount of a compound of the formula:



wherein A is methylene or carbonyl, n is an integer of 2 to 21, inclusive, and R is hydrogen or lower alkyl.

4,514,421
DIETARY AND PHARMACEUTICAL USES OF METHYLSULFONYLMETHANE AND COMPOSITIONS COMPRISING IT

Robert J. Herschler, 3080 NW. 8th Ave., Camas, Wash. 98607

Continuation-in-part of Ser. No. 277,592, Jun. 26, 1981, Pat. No. 4,477,469, which is a division of Ser. No. 71,068, Aug. 30, 1979, Pat. No. 4,296,130. This application Sep. 14, 1982, Ser. No. 418,110
Int. Cl.³ A61K *31/10*
U.S. Cl. 514—711 **18 Claims**

1. A method for ameliorating the symptoms associated with physiological response to stress comprising at least one of gastrointestinal upset and inflammation of the mucous membranes which comprises orally administering to a patient manifesting such symptoms an amount of methylsulfonylmethane effective to ameliorate those symptoms.

4,514,422
NON-STALING GUM COMPOSITION AND METHOD OF PREPARATION

Robert Yang, and Martin M. Rieger, both of Morris Plains, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 22, 1981, Ser. No. 333,523
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—3 **26 Claims**

1. A chewing gum composition having improved resistance to staling, comprising a substantially anhydrous mixture of a gum base, at least one sugar alcohol and glycerin present in an amount ranging from greater than about 10% to about 18% by weight of the chewing gum composition, wherein the gum base possesses a water content of less than 3.5% by weight, the glycerin possesses a water content of less than 1% by weight, the sugar alcohol possesses a water content of less than 0.7% and wherein said chewing gum composition contains no greater than 2% by weight thereof, of water in any form.

4,514,423
PROCESS OF PREPARING AN IMPROVED BUBBLE CHEWING GUM

Shichigoro Tezuka, Kawasaki; Yoshinori Sato, Niiza; Masaki Shibata, Tokyo, and Nobuyuki Harikae, Funabashi, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 266,434, May 22, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 576,761
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—3 **6 Claims**

1. In the process for preparing a bubble gum having strengthened membrane forming properties wherein a bubble gum base including vinyl acetate resin, filler, emulsifiers and flavor, color and fragrance additive is prepared, the improvement of forming said base free of an ester gum, and incorporating therewith a fat or oil ingredient in an amount of between 2.5% to 15% by weight of said product, rubber in an amount not less than 15% by weight of said product, and a wax in an amount of between 15 to 17 parts by weight of said product while maintaining said product free of any ester gum.

4,514,424
FERMENTATION COMPOSITION USING A SELECTED LACTOBACILLUS

Moshe Raccach, Tempe, Ariz., assignor to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 268,354, May 29, 1981, Pat. No. 4,407,828. This application Feb. 22, 1983, Ser. No. 468,145
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.
Int. Cl.³ A23L *1/31, 1/08;* C12R *1/245*
U.S. Cl. 426—56 **6 Claims**

1. A composition containing a culture of a lactobacillus adapted for meat fermentations which comprises:

(a) a culture of a strain of a lactobacillus at a concentration of at least about 1×10^7 of the lactobacillus per ml and having a pH between about 4 to 8 wherein the strain of lactobacillus has the meat fermentation characteristics at least as rapid as *Lactobacillus casei* subspecies *alactosus* NRRL-B-12,344 so as to produce a pH of less than about 5 at 24° C. and wherein the strain is unable to ferment glycogen, lactose or starch in the meat containing between about 0.01 to 50% by weight of the culture; and

(b) a food grade metal salt in an amount sufficient to accelerate the fermentation of the lactobacillus in the meat by providing a concentration of the metal ion between 0.01 ppm and 1500 ppm in the meat.

4,514,425
MOLD GROWTH INHIBITOR AND METHOD

Herbert J. Rebhan, New Richmond, Wis., assignor to Domain, Inc., New Richmond, Wis.

Filed Mar. 29, 1982, Ser. No. 363,123
Int. Cl.³ A23B *9/00*
U.S. Cl. 426—93 **8 Claims**

1. Method of inhibiting mold growth in grain comprising coating the grain with an effective amount of a dry, particulate mixture containing synergistic mold-inhibiting quantities of sodium diacetate and sorbic acid or a salt thereof in which the weight ratio of sorbic acid or its salt to sodium diacetate ranges from about 0.2/1 to about 0.7/1.

4,514,426
PACKAGE AND METHOD FOR THE AUTOMATIC CONTROL OF THE DEGREE OF COOKING OF A CEREAL

J. Kirk Jordan, Franklin, and Sandra L. Scherling, Nashville, both of Tenn., assignors to Martha White Foods, Inc., Nashville, Tenn.

Filed Jul. 27, 1983, Ser. No. 517,674
Int. Cl.³ A23L *1/168;* B65B *29/08;* B65D *81/34*
U.S. Cl. 426—113 **39 Claims**

1. A package containing cereal for the automatic control of the degree of cooking of cereal when said package containing said cereal is disposed in an excess volume of hot water, comprising:

(1) a porous closed container having a predetermined volume and made of a hot water resistant material such that the container may be disposed in said excess volume of hot water for extended periods of time without substantial deterioration thereof;

(2) a predetermined amount of uncooked granular cereal disposed within said container such that the ratio of the predetermined volume of the container when the cereal is fully cooked and the container, if flexible, is expanded to its maximum volume, in cubic centimeters, to the weight of uncooked cereal, in grams, disposed within the container is from 3:1 to 8:1;

said container having pore sizes such that a substantial amount of the uncooked granular cereal disposed in the container cannot pass through said pores, but said pores being of sizes such that water from the excess volume of hot water may freely pass through said pores when the container is disposed in said excess volume of hot water but wherein said pores will be substantially closed to the passage of water to said cereal after it is expanded and fully cooked;

said predetermined amount of uncooked granular cereal disposed within said container and said predetermined volume of said container when the cereal is fully cooked and said ratio therebetween is sufficient to allow for the cereal at a predetermined time to expand to a volume which is at least substantially the same as the predetermined volume of the container and the expansion of the cereal at said predetermined time being sufficient to cause the cereal to substantially contact and close substantially all of the pores of the container with said closing of the pores at said predetermined time thus preventing any substantial amount of additional hot

water from passing from the excess volume of hot water outside the container to the cereal inside the container; said predetermined time being that time when the cereal reaches its fully cooked state and not before it reaches its fully cooked state and not after it reaches its fully cooked state, such that the cereal is not under cooked, that is runny, or overcooked, that is too thick.

4,514,427

REMOVAL OF BITTER NARINGIN AND LIMONIN FROM CITRUS JUICES CONTAINING THE SAME

Donald H. Mitchell; Richard M. Pearce, both of Winter Haven; C. Byron Smith, Lake County, and Sand T. Brown, Lakeland, all of Fla., assignors to Mitco Water Laboratories Inc., Winter Haven, Fla.

Filed May 19, 1983, Ser. No. 496,340
Int. Cl.³ C12H *1/04;* A23L *2/00*
U.S. Cl. 426—271 **3 Claims**

1. A method of concurrently reducing acidity and the naringin and/or limonin content of citrus juices containing the same which comprises contacting such juice with a mass of particles of a weak base anionic exchange resin having a matrix of a styrene polymer and functional groups derived from a mono or polyamine, the duration of such contact being sufficient to substantially reduce simultaneously said naringin and/or limonin content and the acidity of said juice.

4,514,428

CRISP APPLE SNACK AND PROCESS FOR MAKING SAME

Richard W. Glass, College Station, and Dennis W. Koerner, Bedford, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Apr. 13, 1983, Ser. No. 484,488
Int. Cl.³ A23L *3/34, 1/212*
U.S. Cl. 426—321 **10 Claims**

1. A process for preparing crisp wafer-shaped apple snacks comprising the steps of

slicing whole apples to form slices having a thickness in the range from about 0.040 to 0.120 inches;

washing the seeds from the slices;

treating the washed slices with an anti-browning agent;

steeping the treated slices in a sugar solution at a temperature of about 37°–60° C. for a period of about 3 to 10 minutes; and

rapidly drying the steeped slices in less than 30 minutes at a temperature within the range of about 200° to 300° F.

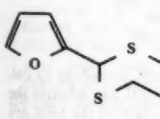
4,514,429

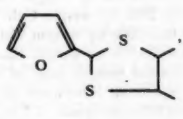
FLAVORING WITH FURFURYL MERCAPTALS

Alan O. Pittet, Atlantic Highlands; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

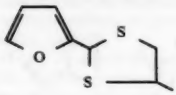
Division of Ser. No. 541,151, Oct. 12, 1983,. This application Aug. 24, 1984, Ser. No. 643,710
Int. Cl.³ A23L *1/226*
U.S. Cl. 426—535 **4 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.5 parts per million up to about 100 parts per million based on the total composition of at least one mercaptal selected from the group consisting of





-continued



wherein the dashed line represents a carbon-carbon single bond or no bond; wherein R_1 and R_2 are the same or different and each represents hydrogen, methyl or ethyl; wherein p is 0 or 1; and wherein X represents a phenyl moiety having the structure:

or a furyl moiety having the structure:

4,514,430

PROCESS FOR PREPARING BAKED GOODS WITH IMPROVED FLAVOR AND FLAVOR CHIP TEXTURE

Kenneth T. Hartman, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jul. 27, 1983, Ser. No. 517,812
Int. Cl.³ A21D *2/00*
U.S. Cl. 426—549 **21 Claims**

1. A process for preparing a dough or batter to be used in making baked goods, wherein the contents of said dough or batter include flavor chips and edible oil or fat, comprising:

(a) pre-mixing said flavor chips with a fluid, heated edible oil, said oil having a melting point below about 100° F.;

(b) soaking said flavor chips in said oil, without melting said flavor chips, until the oil and fat content of said flavor chips is at least about 33% by weight;

(c) chilling said mixture of oil and flavor chips to a temperature at which said flavor chips are substantially solid; and

(d) admixing said chilled mixture of oil and flavor chips with a dough or batter.

4,514,431

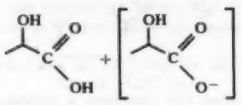
ENHANCING THE TASTE OF A MEAT-FLAVORED FOODSTUFF

Lawrence Buckholz, Jr., Jackson; Richard A. Wilson, Westfield, and Roger Kleinberg, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

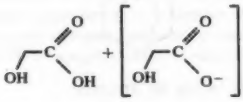
Division of Ser. No. 507,289, Jun. 23, 1983, Pat. No. 4,471,002, which is a continuation-in-part of Ser. No. 445,766, Nov. 30, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 604,266
Int. Cl.³ A23L *1/22*
U.S. Cl. 426—641 **10 Claims**

1. A process for enhancing the taste of a meat-flavored foodstuff comprising the step of adding to said foodstuff a taste enhancing quantity of a mixed seasoning composition of matter consisting essentially of:

(a) from about 0.25 up to about 0.80 mole percent on a dry basis of a lactic acid/lactate species mixture having the structure:



(b) from 0 up to about 0.09 mole percent on a dry basis of glycollic acid/glycollate ion species mixture having the structure:



(c) from 0 up to about 10.0 mole percent on a dry basis of magnesium ion;

(d) from about 6 mole percent up to about 50 mole percent on a dry basis of a phosphate/monoacid phosphate/diacid phosphate/phosphoric acid species mixture having the formula:

$$[PO_4^{---}]+[HPO_4^{--}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate;

(e) from 0 mole percent up to about 40 mole percent on a dry basis of sodium ion;

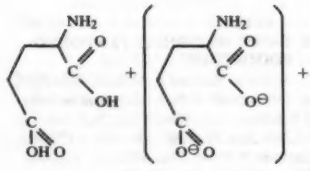
(f) from about 8 mole percent up to about 50 mole percent on a dry basis of potassium ion;

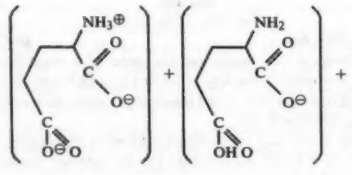
(g) from about 0.3 mole percent up to about 16 mole percent on a dry basis of chloride ion;

(h) from 0 mole percent up to 30 mole percent on a dry basis of carbonate/bicarbonate/carbonic acid species mixture having the formula:

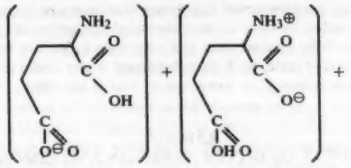
$$[CO_3^{--}]+[HCO_3^{-}]+H_2CO_3$$

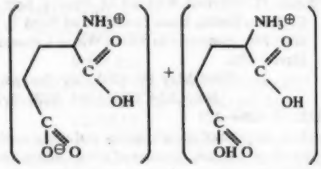
(j) from 0 mole percent up to about 2.0 mole percent on a dry basis of monobasic glutamate/dibasic glutamate/glutamic acid species mixture having the formulae:





-continued





(k) from 0 up to about 0.6 mole percent on a dry basis of calcium ion;

with the proviso that the sum total of mole percent on a dry basis of sodium ion, potassium ion, magnesium ion and calcium ion is from about 48 mole percent up to about 60 mole percent; and with the proviso that the sum total of carbonate/bicarbonate/carbonic acid ion species mixture having the formula:

$$[CO_3^{--}]+[HCO_3^{-}]+H_2CO_3$$

taken together with the sum total mole percent on a dry basis of the phosphate/monobasic phosphate/dibasic phosphate species mixture having the formula:

$$[PO_4^{---}]+[HPO_4^{--}]+[H_2PO_4^{-}]+H_3PO_4$$

taken alone or taken further together with at least one of the species tripolyphosphate, pyrophosphate and/or polymetaphosphate is from about 34 mole percent up to about 50 mole percent; the term "mole percent" being based upon the total moles of cations, anions and free organic acid which is substantially non-ionized in the composition and with the additional proviso that the sum total of:

(i) magnesium ion;

(ii) monobasic glutamate/dibasic glutamate/glutamic acid species mixture; and

(iii) calcium ion is greater than 0, is of a finite amount and is functionally effective.

4,514,432

HEN-EGG ALBUMEN SUBSTITUTE AND METHOD FOR ITS MANUFACTURE

Michael Grzinia, Schwaikheim, Fed. Rep. of Germany, assignor to Milei GmbH, Leutkirch, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 479,006

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211681

Int. Cl.³ A23J *3/02, 1/02*

U.S. Cl. 426—656 **12 Claims**

1. Method for manufacturing aa hen-egg albumen substitute comprising dry-mixing a protein mixture comprising 35 to 90% by weight protein and a salt mixture comprising:

33.9 to 47.3% by weight Monocalcium phosphate

26.1 to 38.7% by weight Calcium hydroxide

6.0 to 20% by weight Calcium chloride

3.0 to 20.0% by weight Calcium Stearate

3.0 to 20.0% by weight Xanthane

wherein the weight ratio of monocalcium phosphate to calcium hydroxide is between 1.0:1.0 and 1.3:1.0, and wherein the salt mixture comprises 12.5 to 20% by weight of the total dry mixture.

4,514,433
PROCESS FOR PRODUCING AN ASEPTIC PACKED TOFU

Masaru Matsuura, Noda, Japan, assignor to Kikkoman Corporation, Noda, Japan

Filed Oct. 21, 1983, Ser. No. 544,379
Claims priority, application Japan, Oct. 22, 1982, 57-184674; Feb. 23, 1983, 58-27668
Int. Cl.[3] A23J 3/00; A23L 1/20
U.S. Cl. 426—634 10 Claims

1. In a process for producing an aseptic packed tofu comprising:

(a) a step of putting into a grinder soybeans with 3–5 times their dry weight of water and grinding the soybeans to obtain a soybean slurry;

(b) a step of heating the soybean slurry at 80° to 100° C. and then filtering the heated soybean slurry to obtain a soybean milk;

(c) a step of heat-sterilizing the soybean milk at a temperature not lower than 130° C. for at least 1 second;

(d) a step of aseptically adding a sterilized coagulant to the sterilized soybean milk, mixing them, aseptically packing the mixture into a sterilized container and sealing the container; and

(e) a step of heating the sealed mixture at 70° to 100° C. to coagulate it, the improvement which comprises carrying out the step of grinding soybeans at 40° to 50° C.

4,514,434
MEAT PATTY AND PROCESS FOR FORMING THE SAME

Robert D. Goldberger, Wayzata, and James F. Stower, South St. Paul, both of Minn., assignors to Goldberger Foods Inc., Minneapolis, Minn.

Filed Apr. 21, 1983, Ser. No. 487,285
Int. Cl.[3] A22C 7/00
U.S. Cl. 426—646 13 Claims

grind meat product by passing meat product through grinder having grinder stove plate with openings of a predetermined selected size
chill or maintain temperature of meat product in chilled condition
provide forming die having extended upper and lower surfaces and vertically disposed side walls with an uneven outline including a plurality of outwardly extending peripherally distributed recesses to receive ground meat
force ground meat into die at pressure between about 70 and 80 psi within die to provide preform having substantially parallel upper and lower surfaces
remove preform thus prepared from die and subject preformed patty to pressure by pressing upper and lower surfaces of patty toward one another to flatten preform in two successive stages
said pressing stages cause patty to extend radially in all directions whereby a plurality of peripherally distributed oblate outwardly arched segments defining projections of irregular shape and distribution are formed around periphery of patty, said pressing also causes centrally projecting compression fracture lines to form between oblate projections
maintain patty free from contact with molding, shaping or other smooth surfaced objects during and after successive pressing steps to thereby maintain the natural irregular contour of patty resulting from radial flow of particles resulting from pressing steps

1. A meat product comprising,

a chilled compressed patty of predetermined weight composed of ground meat particles having a particle grind size of from about 3/32 to about 5/32",

the chilled patty being compressed to a state sufficient to provide enough cohesion between said particles to cause the patty to resist falling apart when cooked in a frying pan or on a grill and the compression of the patty being limited such that said patty when cooked has a loose chewing texture with little resiliency so that bites fall apart easily when chewed and said patty has a repeated compression value of less than 70% following cooking,

the patty having extended upper and lower surfaces that are substantially parallel to each other and connected together by a peripheral side edge composed of a series of outwardly arched segments defining projections of varying shape and distribution, said peripheral edge being free from smooth molded surfaces as produced by shaping, forming or molding members

said projections having natural flow contours of meat displaced outwardly from the center of the patty

said projections causing the patty to fall apart more naturally and easily when chewed and making possible taste and texture variations during cooking due to the projections cooking at a different rate and reaching a different cooking temperature than central portions of the patty,

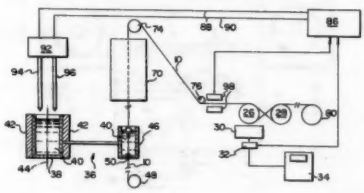
said patty having centrally projecting fracture lines between the projections, at least some of said fracture lines extending from the upper to the lower surfaces of the patty and from the edge partially toward the center of the patty and

the fracture lines and interstices between particles being adapted to absorb and retain cook-out juices for flavor enhancement.

4,514,435
METHOD FOR PRODUCTION OF DIELECTRIC INSULATION LAYERS UPON ELECTRICAL CONDUCTORS

Michael A. Shannon, Glenburnie, and Robert J. Howat, Kingston, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1984, Ser. No. 597,393
Int. Cl.[3] B05D 1/04
U.S. Cl. 427—8 7 Claims



1. A method of monitoring a quantity of magnetically permeable particles in a dry dielectric carrier layer surrounding a conductor comprising passing the conductor surrounded by the layer along a feedpath and through a magnetic field created by a magnet means to cause a magnetic attraction between the particles and the magnet means, the degree of which is dependent upon the strength of the magnetic field and the quantity of particles in the layer which are affected by the field, and monitoring the degree of relative movement towards each other of the conductor and magnet means as the conductor moves along its path, while applying a resisting force against such relative movement.

4,514,436
METHODS OF HIGHLIGHTING PINHOLES IN A SURFACE LAYER OF AN ARTICLE

Kenneth G. Moerschel, Bethlehem, Pa., assignor to AT&T Technologies, Inc., New York, N.Y.

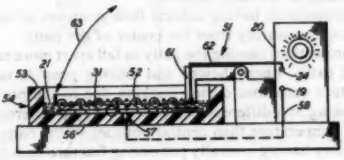
Filed Jul. 28, 1983, Ser. No. 518,189
Int. Cl.[3] B05D 5/12
U.S. Cl. 427—10 18 Claims

1. A method of highlighting pinholes in a dielectric layer on a surface of an article such pinholes having been formed in an etching process through similar pinholes in a protective photoresist layer covering the dielectric layer, which comprises:

submersing into a liquid at least a portion of the article including the photoresist layer covering the dielectric layer wherein pinholes are to be highlighted;

applying an electrical potential through the pinholes in the photoresist layer between the liquid and the article to

dissolve, in regions adjacent to such pinholes, the photoresist layer in a localized reaction at an interface between



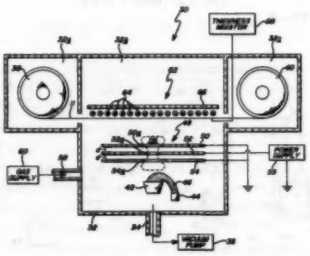
the liquid and the article at each of the pinholes formed in the dielectric layer.

4,514,437

APPARATUS FOR PLASMA ASSISTED EVAPORATION OF THIN FILMS AND CORRESPONDING METHOD OF DEPOSITION

Prem Nath, Rochester, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed May 2, 1984, Ser. No. 606,014
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—39 **29 Claims**



1. An improved method of depositing a thin film onto a substrate, said method including the steps of:
vacuumizing a chamber;
providing an electrically unbiased substrate in the chamber;
providing a supply of solid vaporizable material in the chamber;
heating the solid material with electron beam means so as to vaporize said material in a vapor zone formed between the substrate and the supply of solid material;
disposing electrode means in the vapor zone, said electrode means operatively disposed in electrical communication with a source of alternating current;
providing an ionizable gas; and,
activating the source of alternating current so as to energize the electrode means and develop an ionized plasma from at least the ionized gas, said ionized plasma developed in a plasma region formed proximate the electrode means; whereby the vaporized solid material is activated by the plasma and deposited as a thin film onto the substrate.

14. Apparatus for depositing a thin film onto a substrate, said apparatus including:
a vacuum chamber;
means for vacuumizing the chamber;
means for supporting an electrically unbiased substrate;
a source of solid vaporizable material operatively disposed in the vacuum chamber;
electron beam means adapted to vaporize the solid material in a vapor zone formed between the substrate and the supply of solid material;
a source of ionizable gas;
electrode means operatively disposed proximate the source of solid material in the vapor zone; said electrode means adapted to develop an ionized plasma from at least the ionizable gas, said plasma developed in a plasma region formed proximate the electrode means; and
a source of alternating current operatively disposed in electrical communication with the electrode means, whereby activating the source develops the plasma and the plasma activates the vaporized solid material for the deposition thereof as a thin film onto the substrate.

4,514,438

USE OF RADIATION-CURABLE ACRYLATES TO SURFACE MODIFY POLYETHYLENE TEREPHTHALATE TO IMPROVE ADHESION TO STANDARD RUBBER ADHESIVES AND THEREBY TO RUBBER-BASED MATERIALS

Gunilla E. Gillberg-LaForce, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,882
Int. Cl.³ C08J *7/18*; C08L *9/08, 61/06, 67/02*
U.S. Cl. 427—54.1 **35 Claims**

1. A process for the surface modification of a polyethylene terephthalate material to provide improved adhesion in subsequent rubber-reinforcing applications which comprises (1) applying to the surface of said material at least one radiation-curable acrylate monomer and photopolymerizing said at least one acrylate monomer by exposure of the material to a radiation source to obtain surface modification of said polyethylene terephthalate material; and (2) applying a phenolic-aldehyde-latex adhesive to said acrylate-modified material wherein improved adhesion to rubber is attained.

12. A process for pretreating polyethylene terephthalate filament or yarn to attain improved adhesion in subsequent rubber reinforcing applications which comprises (1) applying a spin finish to the filament or yarn; (2) applying at least one radiation-curable acrylate monomer to said filament or yarn and photopolymerizing said at least one acrylate monomer by exposure of the filament or yarn to a radiation source to obtain surface modification of said polyethylene terephthalate filament or yarn; and (3) applying a phenolic-aldehyde-latex adhesive to said filament or yarn wherein improved adhesion to rubber is attained.

4,514,439

DUST COVER

Nicholas A. Rounds, New Britain, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 16, 1983, Ser. No. 533,096
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—54.1 **13 Claims**

1. A process for forming an optically transparent polymeric protective layer on an information disc which comprises, placing the disc in a stationary horizontal position, applying a monomer containing liquid radiation curable coating to the surface of said stationary disc from an applicator disposed above the disc, applying said coating by equally spaced sequential movement of said applicator on a plane parallel to the surface of said staitonary disc, allowing said liquid coating to spread evenly across said disc surface, and curing said coating by means of radiation to form a thin, even, optically transparent polymeric protective layer over said disc.

4,514,440

SPIN-ON DOPANT METHOD

Bruce H. Justice, East Aurora, and Robert F. Aycock, Clarence, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 12, 1983, Ser. No. 560,473
Int. Cl.³ B05D 5/12, 3/12; H01L 7/44
U.S. Cl. 427—85 8 Claims

1. A single furnace method for boron dopant deposition and diffusion of a p-type semiconductor substrates comprising:

(a) applying a dopant layer to said semiconductor substrate from a gaseous dopant source until an initial resistivity in the range of about 4 to about 200 ohms per square is attained;

(b) producing a conducting interfacial layer between said semiconductor substrate and said dopant layer by maintaining a temperature of at least about 900° C.;

(c) removing said dopant source by maintaining a steam atmosphere of at least about 900° C.;

(d) thermal ramping said treated semiconductor substrate to a drive in temperature for the doping in an atmosphere selected from inert, oxidizing or steam;

(e) oxidizing excess silicon boride by subjecting said treated semiconductor substrate for about 5 to 20 minutes in a steam atmosphere at a temperature of the order of 1050° C. to 1250° C.; and

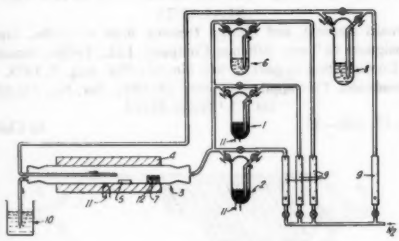
(f) driving the boron present in said interfacial layer to the desired depth and resistivity level in an inert or oxidizing atmosphere.

4,514,441

DIELECTRIC MATERIALS

John H. Alexander, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,197
Claims priority, application United Kingdom, Nov. 17, 1982, 8232779
Int. Cl.³ B05D 5/12
U.S. Cl. 427—126.6 6 Claims



1. A method of manufacturing thin film dielectric material comprising the steps of:

directing vapors of reactants containing lead and at least two additional metals including Fe and Nb and an oxidizing gas onto a substrate having a temperature at which oxides result from the reaction of the reactants with the oxidizing gas in a solid form on the substrate to form a thin film dielectric material layer thereon.

4,514,442

METHOD OF PROTECTING A ROOF

Allen E. Crepeau, Southbury, Conn., assignor to Uniroyal, Inc., Middlebury, Conn.

Division of Ser. No. 381,259, May 24, 1982, Pat. No. 4,461,875, which is a continuation-in-part of Ser. No. 363,325, Mar. 29, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,250
Int. Cl.³ B32B 35/00
U.S. Cl. 427—140 13 Claims

1. A method of protecting a roof against water leaks comprising the disposition upon said roof of a composition comprising:

(a) 100 parts of an elastomer selected from the group consisting of EPDM, butyl rubber and mixtures thereof;

(b) 0.1 to 3.0 parts of a compound having the structural formula $[(CH_2)_nNCS]_2S_6$, where n is 4 or 5; and

(c) 0 to 5.0 parts of a sulfur donor curative;

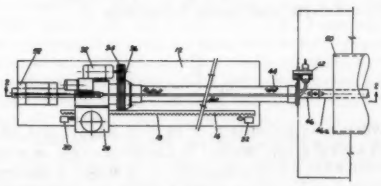
wherein said components (b) and (c) provide at least 0.25 part of total available sulfur, all parts being by weight.

4,514,443

COATING INTERNAL SURFACES OF CURVED CONDUITS

Gene Kostecki, 40 Bramwell Rd., Noranda, Australia

PCT No. PCT/AU82/00224, § 371 Date Sep. 8, 1983, § 102(e) Date Sep. 8, 1983, PCT Pub. No. WO83/02573, PCT Pub. Date Aug. 4, 1983
PCT Filed Dec. 30, 1982, Ser. No. 537,456
Claims priority, application Australia, Jan. 29, 1982, PF2503; Sep. 22, 1982, PF6007; Sep. 22, 1982, PF6008
Int. Cl.³ B05D 7/22; B05C 7/00
U.S. Cl. 427—230 20 Claims



1. A method of coating an internal wall of a curved conduit which comprises the steps of inserting a guide means in the conduit which guide means extends substantially axially of the conduit, said guide means having a longitudinally flexible member in association with it so as to cause the flexible member to be longitudinally guided by the guide means, connecting a coating member to one end of said flexible member, providing drive means for moving said flexible member and then said coating means relative to and longitudinally of said conduit, causing the coating means to deposit a layer of protective material in a strip extending longitudinally of said conduit and then rotationally incrementally stepping the flexible member and the coating means to an adjacent position and reversing the drive means so as to cause the coating means to deposit a further strip of protective material adjacent the first coated strip.

2. An apparatus for use with a coating means to coat an internal wall of a curved conduit with a layer of protective material, comprising:

means including a longitudinally flexible member which is transversely substantially rigid and guide means for said flexible member;

means for mounting the coating means adjacent a first end of the flexible member, for incremental rotation with the flexible member;

a drive means for driving the flexible member relative to the curved conduit to be coated, so that the coating means can enter the curved conduit and so that the coating means

can deposit a strip of protective material longitudinally of the curved conduit; and

stepping means coupled to the flexible member for automatically stepping the flexible member and the coating means by a rotational increment after the coating means has completed a traverse of the conduit.

4,514,444

FABRIC CLEANING/CONDITIONING COMPOSITIONS

Donald T. Ives, Covington, Ky.; Michael J. Madill, and Philip G. Sliva, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 3, 1984, Ser. No. 576,597
Int. Cl.³ D06M *13/18, 13/20, 13/36, 13/40*
U.S. Cl. 427—242 **14 Claims**

1. Fabric conditioning nodules which comprise:

(a) a fabric conditioning agent comprising a salt of

(i) a tertiary amine having the formula

wherein R_1, R_2 and R_3 are each, independently, saturated or unsaturated and wherein R_1 is a long chain aliphatic group having from 12 to 22 carbon atoms and R_2 and R_3 are the same or different from each other and are selected from the group consisting of aliphatic groups containing from 1 to 22 carbon atoms, hydroxyalkyl groups of the formula $—R_4OH$ wherein R_4 is an alkylene group having from 1 to 3 carbon atoms, and alkyl ether groups having the formula $R_5O(C_nH_{2n}O)_m$—wherein R_5 is hydrogen or an alkyl or alkenyl group having from 1 to 20 carbon atoms, n is 2 or 3, and m is from 1 to 20; and

(ii) a carboxylic acid having the formula

wherein R_6 is hydrogen, or an alkyl, alkenyl, aryl, alkaryl or aralkyl group having 1 to 22 carbon atoms, or a substituted alkyl, alkenyl, aryl, alkaryl, or aralkyl group having from 1 to 22 carbon atoms wherein the substituents are selected from the group consisting of halogen, carboxyl, and hydroxyl; and

(b) from about 0.5% to about 15% by weight based on the weight of the fabric conditioning nodules of polyethylene glycol having a molecular weight from about 2000 to about 16,000;

wherein the particle size of said nodules is from about 0.03 mm. to about 1 mm.

11. A fabric cleaning/conditioning composition which comprises:

(a) fabric conditioning nodules according to claim 1 wherein the amount of amine salt is from 3% to 20% of the composition; and

(b) detergent granules comprising:

(i) from 5% to 30% by weight of the composition of surfactant selected from the group consisting of water soluble salts of alkyl benzene sulfonate, alkyl sulfate, alkyl polyethoxy ether sulfate, paraffin sulfonate, alpha-olefin sulfonate, alpha-sulfocarboxylates and their esters, alkyl glyceryl ether sulfonate, fatty acid monoglyceride sulfates and sulfonates, alkyl phenol polyethoxy ether sulfate, 2-acyloxy-alkane-1-sulfonate and soaps; and

(ii) from 10% to 60% by weight of the composition of detergency builder selected from the group consisting of alkali metal carbonates, borates, phosphates, polyphosphates, bicarbonates and silicates; water-soluble aminopolycarboxylates, water-soluble polyphosphonates, water-soluble salts of polycarboxylate polymers and copolymers, citric acid, and crystalline and amorphous sodium aluminosilicates.

4,514,445

PROCESS FOR FORMING A CORROSION RESISTANT COATING

Sadakazu Hokamura, Yamato; Seiji Yamada, Yokohama; Mitsutoshi Aritomi, and Yuji Yoshida, both of Ami, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, both of, Japan

Filed Nov. 8, 1983, Ser. No. 549,735
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—410 **4 Claims**

1. A process for forming a corrosion resistant coating, which comprises (i) a step of priming a solvent-type coating composition on a corrodible substrate and drying it to form a prime coat, and (ii) a step of coating a radical-polymerizable, and oxidation-polymerizable, room temperature curing solventless coating composition on the dry prime coat and polymerizing it to form a cured coating,

wherein the solvent-type coating composition contains a volatile organic solvent and is selected from the group consisting of a boiled drying oil coating composition, an alkyd resin coating composition, an epoxy resin coating composition, a polyurethane resin coating composition, a chlorinated rubber coating composition and a vinyl resin coating composition, and

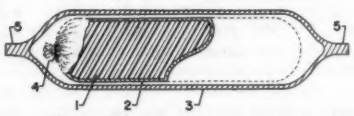
wherein the radical-polymerizable and oxidation-polymerizable, room temperature curing solventless coating composition is composed essentially of a curing catalyst and a resin component comprising (A) from 30 to 70% by weight an oil-modified alkyd resin having an oil length of from 30 to 70% and modified with an α,β-unsaturated monocarboxylic acid selected from the group consisting of sorbic acid, crotonic acid and 2-(β-furyl) acrylic acid, the content of the α,β-unsaturated monocarboxylic acid in the alkyd resin being from 0.5 to 30% by weight, and (B) from 70 to 30% by weight of a polymerizable monomer in which the ingredient (A) is dissolved.

4,514,446

WATER IMPERMEABLE PACKAGE FOR ROOM TEMPERATURE-MOISTURE CURING ONE-PART SEALANTS

Motoaki Kadono, and Shingo Tamura, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 931,594, Aug. 7, 1978, abandoned. This application Jun. 15, 1981, Ser. No. 273,696
Int. Cl.³ B65D *81/34*
U.S. Cl. 428—35 **10 Claims**

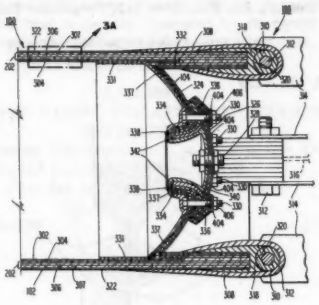


1. A method of storing room temperature moisture curing one-part sealants which consists of placing a moisture curable, one-part sealant in a sealable inner flexible resin film container, which container is enclosed by a separate sealable outer resin film wrap which outer resin film wrap has, on at least one surface, a thin layer of aluminum.

4,514,447
INFLATABLE STRUCTURAL COLUMN

James G. Boxmeyer, 512 S. 47th St., Philadelphia, Pa. 19143

Filed Mar. 23, 1984, Ser. No. 592,615
Int. Cl.³ F16L 55/12
U.S. Cl. 428—36 14 Claims



1. An inflatable support member comprising a substantially tubular body having attachment means on at least one end thereof, said tubular body being collapsible prior to introduction of inflating fluid and comprising:

(a) a sealable inner liner impermeable to said inflating fluid;

(b) at least one first layer of filaments spirally wound in a first direction at a first predetermined angle with respect to the longitudinal axis of said tubular body;

(c) at least one second layer of filaments spirally wound in a second direction opposite said first direction, at a second predetermined angle with respect to said longitudinal axis;

(d) a layer of longitudinally oriented filaments disposed between said first and second layers of filaments;

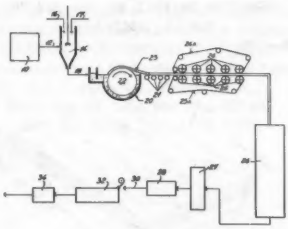
(e) means for bonding said filaments together, said bonding means becoming stiff after curing; and

(f) means for inhibiting the curing of said bonding means until after said support structure has been inflated.

4,514,448
HARDBOARD-LIKE PANEL

Jacques Grignon, Neuville, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Dec. 28, 1982, Ser. No. 454,072
Int. Cl.³ B32B 11/02, 11/04
U.S. Cl. 428—68 4 Claims

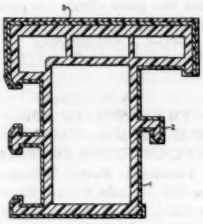


1. A rigid and light panel having a rigid core, and a wrapping enclosure surrounding said core, said rigid core comprising wood fibres and asphalt intimately mixed together, said asphalt being 10–30% by weight of said core, and at least 50% by volume of said core being air cells, said wrapping enclosure comprising a resin-impregnated paper glued to the rigid core so as to form a hard shell thereabout, said panel having a R value of at least 0.8.

4,514,449
PROFILE STRIP, ESPECIALLY FOR THE PRODUCTION OF WINDOW OR DOOR FRAMES

Wolfgang Budich, Troisdorf-Eschmar; Bertram Gasper, Troisdorf-Spich; Josef Kurth, Troisdorf-Spich; Karl-Günter Scharf, Troisdorf-Spich, and Waldemar Wissinger, Siegburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 461,871
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202918
Int. Cl.³ B32B 5/16, 27/30
U.S. Cl. 428—76 16 Claims

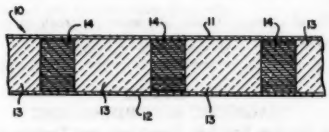


1. A profile strip for the manufacture of frames for windows or doors comprising a core profile formed of reinforced synthetic resin and a synthetic resin shell surrounding at least a part of the core profile; said core profile being formed of a glass fiber-reinforced polyvinyl chloride resin-containing composition, additionally containing per 100 parts by weight of a polyvinyl chloride resin having a K value between 55 and 75, 40 to 100 parts by weight of glass fibers having a diameter of between 5 and 25 μm with a length of up to 12 mm, and 0 to 25 parts by weight of a mineral filler with an average particle diameter of below 50 μm; said core profile exhibiting a microporous, slightly roughened surface, and said core profile being bonded to the shell; said shell being free of glass fibers, being formed of a synthetic resin that is compatible with polyvinyl chloride resin and exceeding the impact resistance of the core profile and said strip exhibiting, in the extrusion direction, a modulus of elasticity of at least 8000 N/mm² at 23° C.

4,514,450
PEG SUPPORTED THERMAL INSULATION PANEL

Jeffert J. Nowobilski, Orchard Park, and William J. Owens, Kenmore, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 1, 1983, Ser. No. 547,622
Int. Cl.³ B32B 7/00
U.S. Cl. 428—120 14 Claims



1. An insulation panel suitable for use to insulate a high temperature enclosure comprising two spaced, aligned, thin metal sheets of identical surface area, said metal sheets spaced by a plurality of insulation pegs having no external stabilizing means, having a density of from 30 to 80 pounds per cubic foot and produced by a process comprising:

(a) providing a stack of substantially binderless glass fiber sheets in an amount sufficient to achieve an insulation peg of desired density from 30 to 80 pounds per cubic foot;

(b) providing a press to compress the stack;

(c) heating the stack and the press to a temperature in the range of from the glass strain temperature to less than the glass softening temperature for a time period sufficient to achieve thermal equilibrium of the stack and the press surface;

(d) thereafter compressing the stack by applying a light vertically compressive force of from 2.0 to 20.0 pounds per square inch to the stack for a time period sufficient to produce said desired density and to substantially relieve stress within the compressed stack;

(e) cooling the compressed glass fiber stack to ambient temperature;

said pegs covering from 4 to 30 percent of said surface area and oriented such that the glass fibers are parallel to said metal sheets, with the remaining space between said metal sheets filled with high performance insulation.

4,514,451

POLYESTER SUBSTRATE FOR MAGNETIC RECORDING MEDIUM HAVING OLIGOMER PROTRUSIONS THEREON

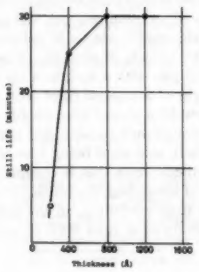
Takashi Suzuki, Takatsuki; Koichi Shinohara, Kobe; Masaru Odagiri, Kawanishi; Takashi Fujita, Kawanishi, and Shigeki Kawase, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 18, 1983, Ser. No. 514,607

Claims priority, application Japan, Jul. 22, 1982, 57-128784

Int. Cl.³ B32B *3/00*; G11B *5/70*

U.S. Cl. 428—141 **9 Claims**



1. A magnetic recording medium comprising:

a polyester substrate having oligomer protrusions at least on its principal face, said protrusions present at a density of 1000/mm² or higher, and

a ferromagnetic thin film having a thickness of 400 Å or larger formed on said principal face, wherein

the heights of said oligomer protrusions are 100Å–14 2000 Å and

the lateral spread of said oligomer protrusions is 1 μm or smaller.

4,514,452

MAGNETIC RECORDING DISK

Kazuhiro Tanaka; Ken-ichi Kawakami, and Toshiya Yoshii, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,136

Claims priority, application Japan, Apr. 20, 1983, 58-68299

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—141 **19 Claims**

1. A magnetic recording disk which comprises (1) a three-layered laminate consisting of a core layer of a biaxially oriented polyolefin film which has a birefringence of not more than 0.01 and an amorphous-region orientation coefficient of not more than 0.2 and two outer layers of a biaxially oriented polyester film adhered to said core layer, and (2) a magnetic layer formed on at least one side of the laminate.

4,514,453

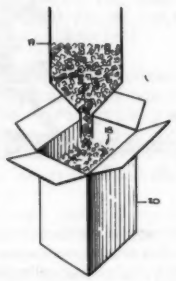
LOOSE FILL PACKING ELEMENT OF HOOKED CONFIGURATION

Harry Bussey, Jr., P.O. Box 115, Serpentine Rd., Navesink, N.J. 07752

Filed May 2, 1983, Ser. No. 490,663

Int. Cl.³ B32B *3/00*; B65D *81/02*

U.S. Cl. 428—159 **9 Claims**



1. A loose fill free flowing packing material comprising a plurality of resilient thermoplastic elements, each said element having a substantially uniform thickness, a body portion having a first flat surface on one side and a second flat surface on an opposite side, a first leg extending integrally from one end of said body portion and passing through a plane of said first surface, a second leg extending integrally from an opposite end of said body portion and passing through a plane of said second surface, a first recess in said first flat surface adjacent said first leg, and a second recess in said second flat surface adjacent said second leg each leg being of a width at the end thereof greater than the width of a respective recess at the mouth thereof, each said leg being of decreasing width inwardly of said end thereof and each said recess being of increasing width inwardly of said mouth thereof to prevent each leg from fitting into a recess of a like element.

4,514,454

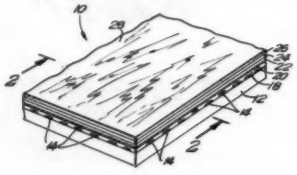
HEAT DISSIPATING DECORATIVE LAMINATE

James Cooley, Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 24, 1983, Ser. No. 544,774

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—195 **11 Claims**



1. A heat resistant decorative laminated panel comprising:

a wood substrate having at least one substantially planar surface;

a discontinuous metal layer applied to said planar surface of said wood substrate, said metal layer covering at least 50% but less than 100% of said planar surface of said wood substrate;

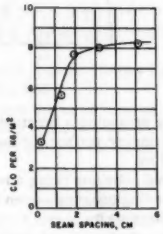
a layer of isocyanate solution extending continuously across the metal layer and penetrating to the wood substrate at the discontinuities in the metal layer to securely bond the metal to the wood substrate;
a layer of adhesive disposed on said isocyanate layer;
a decorative laminate disposed on said adhesive; and
a top coating extending continuously across said decorative laminate, whereby when a heated object is placed on said panel, the heat is rapidly dissipated by the metal layer preventing discoloration and damage to the panel.

4,514,455

NONWOVEN FABRIC FOR APPAREL INSULATING INTERLINER

Sang-Hak Hwang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1984, Ser. No. 634,780
Int. Cl.³ B32B 27/14
U.S. Cl. 428—198 5 Claims



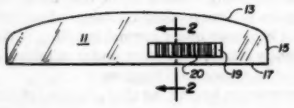
1. A composite nonwoven fabric comprising a batt of crimped polyester staple fibers and a bonded nonwoven sheet of continuous polyester filaments, the batt and the sheet being in surface contact with each other and being attached to each other by a series of parallel seams having a spacing of at least 1.7 cm between successive seams, the staple fiber batt weighing in the range of 100 to 250 g/m^2 and containing a blend of light and heavy fibers, the heavier fibers having a dtex no greater than 20 and being at least twice but no greater than 15 times the dtex of the lighter fibers and the lighter fibers having a dtex in the range of 1 to 3 and amounting to 40 to 85 percent of the batt weight, the filament sheet weighing in the range of 10 to 25 g/m^2, and the nonwoven fabric having an average density in the range of 15 to 24 kg/m^3 and a thermal insulation value per unit weight of at least 7 CLO per kg/m^2.

4,514,456

METHOD OF MAKING A CODED MARKING IN A GLASS WORKPIECE EMPLOYING A TRISILICATE COATING AND PRODUCT THEREOF

Samuel B. Deal, and Barry M. Cushman, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 20, 1982, Ser. No. 420,496
Int. Cl.³ B32B 3/10, 5/16, 7/00
U.S. Cl. 428—204 10 Claims



1. In a method for producing a machine-readable coded marking in a surface of a glass workpiece, said method including

(a) applying to a selected surface area of said glass workpiece an undercoating comprising a first aqueous suspension consisting essentially of first pigment particles and a first alkali silicate binder,
(b) drying said undercoating,
(c) applying to said dry undercoating an overcoating comprising a second aqueous suspension of second pigment particles and a second alkali silicate binder,
(d) drying said overcoating and
(e) recessing a plurality of related marks through said overcoating,

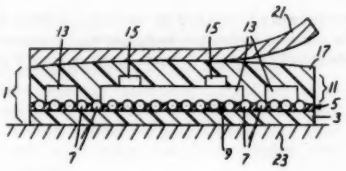
the improvement wherein at least one of said alkali silicate binders consists essentially of a mixture of dissolved sodium silicate, dissolved potassium silicate, and a lithium-stabilized silica sol.

4,514,457

LOW-PROFILE TRANSFER ARTICLE

Makoto Sasaki, Mishimia, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 17, 1983, Ser. No. 467,435
Claims priority, application Japan, Feb. 19, 1982, 57-25688
Int. Cl.³ B32B 3/18; B41M 5/00
U.S. Cl. 428—204 8 Claims



1. A low profile flexible transfer article comprising:

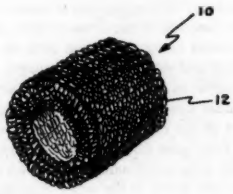
(a) a first layer comprising an adhesive capable of bonding said article to a given substrate.
(b) a second layer securably adhered to said first layer, said second layer comprising a coating of discrete, inert particles, said particles being sufficiently proximately placed relative to one another to present an ink-printable surface, and, optionally, a matrixing agent which fills the voids between said adjacent particles without covering said particles, and
(c) a third layer adhered to said ink-printable surface of said second layer, said third layer comprising at least one stratum of ink defining a predetermined pattern, said article being free of a permanent self-supporting base film.

4,514,458

SPRING-LIKE MATERIAL FORMED OF COMPRESSED METALLIC WIRE

Richard P. Thorn, and Bhagwati P. Gupta, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Nov. 9, 1983, Ser. No. 550,133
Int. Cl.³ D03D 13/00
U.S. Cl. 428—222 8 Claims



1. A resilient and durable metallic material for supporting

loads and accommodating motions within a preselected range of magnitudes, comprising:

a substantially homogeneous mass of drawn metallic wires extending in substantially random relationship to each other; said wires having a predetermined density and high tensile strength, and the diameter thereof being within the range of 0.0035 inch to 0.020 inch;

said wires as initially incorporated within said mass including three-dimensional helical coils spaced along the length thereof at pitch intervals within the range of 0.05 to 0.30 inch and having diameters at least ten times the wire diameter and within the range of 0.05 inch to 0.30 inch;

said mass of coil-containing wires being compacted, by a compression force greater than the maximum force to be applied to the material during use, to impart thereto a preselected shape and a density within the range of 10 percent to 50 percent of said predetermined density;

said wires being substantially free of stress risers other than ones produced by the compaction of mass;

the compression stress/strain properties of said compacted mass being in accordance with the relationship

$$\sigma \leqq 500\ (200^{3.3\epsilon}) \text{ and } \geqq 1000^{1.25\epsilon}$$

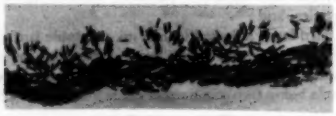
for values of ϵ from 0 to 0.50, wherein σ is stress in psi and ϵ is strain in inches per inch, and said properties being substantially isotropic at strain levels of from 0 to 0.20.

4,514,459

WOVEN FABRIC HAVING A VELVETY APPEARANCE

Junyo Nakagawa; Shinji Yamaguchi; Kiyoshi Hirakawa, all of Kurashiki; Isao Tokunaga, Okayama, and Masaaki Ito, Saijo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 23, 1984, Ser. No. 613,225
Claims priority, application Japan, Jun. 2, 1983, 58-99069
Int. Cl.³ D03D *3/00*
U.S. Cl. 428—229 **8 Claims**



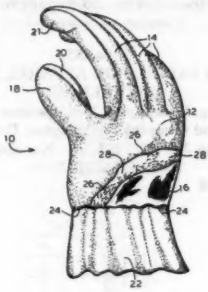
1. A dyed woven fabric having a velvety appearance and excellent bulkiness, characterized in that at least either warp yarns or weft yarns in the fabric comprise flat conjugate fibers having a cross sectional configuration such that the flatness L/W (where L: maximal length of the cross section, and W: maximal width of the cross section) is 3.5–15.0 and the bending angle is 180°–150° and having two kinds of polymers, one different from the other in shrinking percentage in boiling water by more than 2%, conjugating in side-by-side relation in the width-wise direction of the cross section, and the flat conjugate fibers content being more than 20% by weight relative to the entire warp and weft yarns constituents; in that in every section of the fabric as cut parallel to the warp or weft yarns thereof, individual conjugate fibers representing more than 35% by weight of the conjugate fibers content of the fabric, other than the conjugate fibers present at formation points of the fabric, have a cross sectional configuration inclined relative to the surface of the fabric at the angle of inclination (α) being 45°–90°; and in that the floating distance between the formation points of the fabric covers a length of more than ¼ of the pitch of the twist (P) in the conjugate fiber.

4,514,460

SLIP RESISTANT SURFACES

Michael D. Johnson, Coshocton, Ohio, assignor to Becton, Dickinson and Company, Paramus, N.J.

Continuation-in-part of Ser. No. 436,253, Oct. 25, 1982,. This application Jul. 11, 1983, Ser. No. 512,266
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—245 **4 Claims**



1. A laminate for providing a breathable garment having a textured exposed gripping surface for use in a work environment characterized by

(a) a substrate, said substrate being a member selected from the group consisting of a non-woven fibrous web, a woven web, and a knitted web;

(b) a foamed layer applied to one surface of said substrate;

(c) said foamed layer forming the outer exposed gripping surface for a garment made from such laminate; and

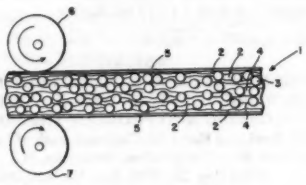
(d) said foamed layer having an air content within the range of between about 40 and 95 percent.

4,514,461

FRAGRANCE IMPREGNATED FABRIC

Yen-Kong Woo, 1545 Geary Blvd., San Francisco, Calif. 94115

Continuation-in-part of Ser. No. 130,728, Mar. 17, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,443
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—240 **1 Claim**



1. A fabric having an impregnation of micro-sized capsules; said capsules being formed by a fragrance emitting core encapsules in a micro-sized container of sufficient strength to resist breakage under normal handling of the fabric but sufficiently fragile to rupture under suitably exerted hand pressure to release said fragrance;

said impregnation having the characteristic of being sprayed with said capsules in company with a liquid binder by a forceful spray to insure complete and uniform penetration of said fabric by said capsules;

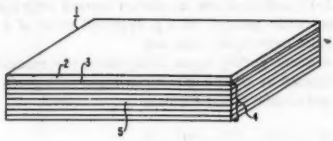
said fabric having the characteristic of having passed lightly between heated pressure rollers to insure absence of any capsules on its surface thus providing a smooth surface on said fabric.

4,514,462

WARP RESISTANT LAMINATES HAVING A CORE IMPREGNATED WITH A MIXTURE OF PHENOLIX RESIN AND ALKYL SUBSTITUTED PHENOL

Lenon G. Brooker, Hampton, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1983, Ser. No. 485,089
Int. Cl.³ B32B 17/10, 27/04
U.S. Cl. 428—285 9 Claims



1. A sheet material, impregnated with a reaction mixture composition consisting essentially of:

(1) a phenolic component selected from the group consisting of phenol, cresol, xylenol, resorcinol, naphthol, and mixtures thereof,

(2) alkyl substituted phenol, where alkyl contains from 4 to 13 carbon atoms, and

(3) aldehyde; where the mole ratio of phenolic component:alkyl substituted phenol is from about 1:0.0035 to 0.5, said composition being in the dried "B"-stage.

4,514,463

LAMINATE SUITABLE AS SEALING LINER FOR LIQUID CONTAINERS

Josef Alteepping, Ochtrup, and Dietrich E. Bornemann, Coesfeld, both of Del.X, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 22, 1984, Ser. No. 592,382
Int. Cl.³ B32B 27/00
U.S. Cl. 428—286 8 Claims

1. A liner for a liquid container comprising a laminate comprising a layer of ethylene/butylacrylate copolymer in an amount of 600 to 1200 grams per square meter thermally bonded to a heat-set, non-woven polyolefin fabric having a weight of 100 to 300 grams per square meter, said ethylene/-butylacrylate copolymer containing 15 to 25 percent butylacrylate on a weight basis.

4,514,464

LAMINATES OF POLYCARBONATE OR ACRYLATE AND PLASTICIZED POLYVINYL BUTYRAL

I. Luis Gomez, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mich.

Filed Dec. 7, 1983, Ser. No. 559,069
Int. Cl.³ B32B 27/08, 27/30, 27/36
U.S. Cl. 428—332 7 Claims

1. A laminate comprising a sheet of polycarbonate or polyacrylate, a sheet of polyvinyl butyral plasticized with a plasticizer which does not significantly craze said polycarbonate or polyacrylate when said plasticized polyvinyl butyral contacts said polycarbonate or polyacrylate and a layer of polyvinylidene chloride or cured urethane acrylate resin interposed between the interfacial surfaces of said sheet of polycarbonate or polyacrylate and said sheet of polyvinyl butyral for bonding said sheets together and resisting delamination on impact at temperatures at least as low as about minus 10° C.

2. The laminate of claim 1 wherein said interposed layer is polyvinylidene chloride.

3. The laminate of claim 1 wherein said interposed layer is urethane acrylate resin.

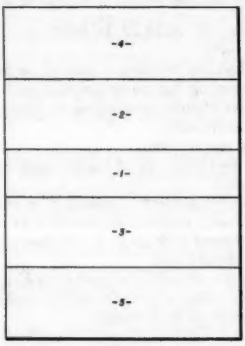
4. The laminate of claim 1, 2 or 3 wherein the thickness of said interposed layer is about 0.013 to 0.13 mm.

4,514,465

STORM WINDOW FILM COMPRISING AT LEAST FIVE LAYERS

Julian H. Schoenberg, Greenville, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed May 30, 1984, Ser. No. 615,418
Int. Cl.³ B32B 27/08
U.S. Cl. 428—339 21 Claims



1. An oriented multilayer film comprising:

a cross-linked core layer comprising either (a) an ethylene vinyl acetate copolymer or (b) a three component blend of (1) a linear low density polyethylene, (2) a linear medium density polyethylene and (3) an ethylene vinyl acetate copolymer;

two cross-linked interior layers each comprising a linear low density polyethylene; and

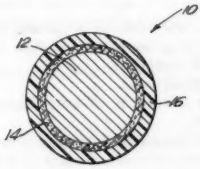
two cross-linked surface layers each comprising a four component blend of (1) a linear low density polyethylene, (2) a linear medium density polyethylene, (3) an ethylene vinyl acetate copolymer and (4) at least one ultraviolet light stabilizer.

4,514,466

FIRE-RESISTANT PLENUM CABLE AND METHOD FOR MAKING SAME

Joseph A. Leon, Jr., and Joseph C. Caprino, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,227
Int. Cl.³ B32B 27/00; H01B 7/00
U.S. Cl. 428—383 4 Claims



1. A tough, fire resistant electrically conductive cable comprising:

(a) an electrically conductive metal core;

(b) a thin continuous tape layer of a resin impregnated mica paper laminated to a glass support selected from the group consisting of a mat, a fabric and a roving wrapped on said metal core; and

(c) an outer coating of platinum catalyzed heat cured silicone rubber over said tape layer.

4,514,467
METHOD OF OBTAINING A POSITIVE BOND BETWEEN PAINTED ARTICLES AND CONCRETE

Heinz Riemer, Bottrop; Joern-Volker Weiss, Haltern, and Friedhelm Mutzberg, Muelheim, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels, AG, Marl, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,039

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222529

Int. Cl.[3] **B32B** *27/38;* **B05D** *3/02, 1/36*

U.S. Cl. 428—413 **15 Claims**

1. A method for bonding a painted surface to concrete, comprising treating the painted surface with an epoxy resin-cement mortar mixture comprising an epoxy resin-salt emulsion which comprises:

(a) a liquid epoxy resin,

(b) about 30–130 wt. % of water based on the amount of epoxy resin,

(c) an emulsifying effective amount of an emulsifier comprising a primary, aliphatic alcohol of 8–14 carbon atoms, an adduct thereof with up to 10 ethylene oxide groups, or a mixture thereof, and

(d) an effective amount of a latent curing agent comprising a reaction product of the essentially complete neutralization of a diamine of the formulae

$$H_2N—CH_2—R—NH_2$$

or

$$H_2N—R—CH_2—R—NH_2$$

with oxalic acid,

wherein R is alkyl substituted alkylene or cycloalkylene each of 6–9 carbon atoms in total, or phenyl alkylene of 7–9 carbon atoms in total,

or

(a) a liquid epoxy resin,

(b) water,

(c) an emulsifier comprising a primary aliphatic alcohol of 12–14 carbon atoms; an adduct thereof with up to 5 ethylene oxide groups; or a polyglycol ester of a C_{10-22}-aliphatic carboxylic acid, and

(d) a latent curing agent comprising the reaction product obtained by complete neutralization with oxalic acid of (i) a polyamine of the formula

$$H_2N—CH_2—CH_2—NH—_xH$$

wherein x=2, 3, or 4,

or of (ii) a reaction product, containing amino groups, of such a polyamine with a fatty acid;

and drying the applied mixture to form a bond to the painted surface.

2. A method for bonding a painted surface to concrete, comprising treating the painted surface with an epoxy resin emulsion which comprises:

(a) a liquid epoxy resin,

(b) about 30–130 wt. % of water based on the amount of epoxy resin,

(c) an emulsifying effective amount of an emulsifier comprising a primary, aliphatic alcohol of 8–14 carbon atoms, an adduct thereof with up to 10 ethylene oxide groups, or a mixture thereof, and

(d) an effective amount of a latent curing agent comprising a reaction product of the essentially complete neutralization of a diamine of the formulae

$$H_2N—CH_2—R—NH_2$$

or

$$H_2N—R—CH_2—R—NH_2$$

with oxalic acid,

wherein R is alkyl substituted alkylene or cycloalkylene each of 6–9 carbon atoms in total, or phenyl alkylene of 7–9 carbon atoms in total,

or

(a) a liquid epoxy resin,

(b) water,

(c) an emulsifier comprising a primary aliphatic alcohol of 12–14 carbon atoms; an adduct thereof with up to 5 ethylene oxide groups; or a polyglycol ester of a C_{10-22}-aliphatic carboxylic acid, and

(d) a latent curing agent comprising the reaction product obtained by complete neutralization with oxalic acid of (i) a polyamine of the formula

$$H_2N—CH_2—CH_2—NH—_xH$$

wherein x=2, 3, or 4,

or of (ii) a reaction product, containing amino groups, of such a polyamine with a fatty acid;

drying the applied emulsion;

treating the emulsion coated surface with a cement mortar mixture; and

drying the applied mixture to form a bond to the painted surface.

15. An article having a painted surface, which is bound to an epoxy resin-cement mortar mixture, and which is prepared by the method of claim 1.

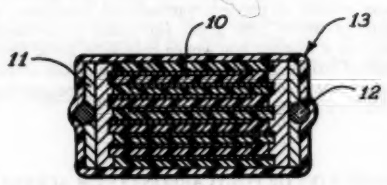
4,514,468
ELECTRONIC COMPONENT WITH UV-CURED COATING

Michael F. Lucey, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 26, 1983, Ser. No. 498,374

Int. Cl.[3] **C08F** *8/00;* **B29C** *5/00*

U.S. Cl. 428—418 **6 Claims**



1. An electronic component having a coating of an ultraviolet light curable composition directly against said component, said coating consisting essentially of a completely ultraviolet light cured product obtained from a mixture of 51 to 59% of a bisphenol A epoxy diacrylate, 34.8 to 44.4% of a cycloaliphatic methacrylate, about 2% of a photoinitiator, about 2% of a peroxide, about 0.2% of a wetting agent, and about 2% of a wet adhesion monomer.

4,514,469
PEENED OVERLAY COATINGS

Joseph F. Loersch, Bolton, and James W. Neal, Columbia, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,727

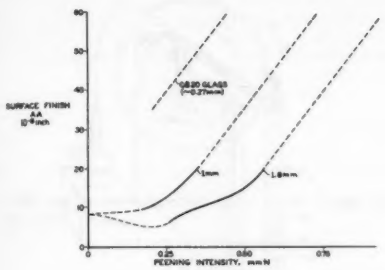
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[3] **B22F** *7/04;* **C21D** *7/06*

U.S. Cl. 428—553 **12 Claims**

1. An article having an overlay coating with a surface finish smoother than about 50×10^{-6} inch Arithmetic Average pro-

duced by a process which comprises first applying a coating to a workpiece, and then peening the coating surface with spherical shot having a diameter uniform to ±4% and a velocity uniform to ±4%, the diameter of the shot lying in the range 1-2.5 mm.



4,514,470

DIFFUSION BONDING BETWEEN TITANIUM BASE ALLOYS AND STEELS

Dan G. Rosenthal, Huntington, and Louis J. Fiedler, Trumbull, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Nov. 22, 1982, Ser. No. 443,469
Int. Cl.³ B32B *15/01*
U.S. Cl. 428—662 **7 Claims**

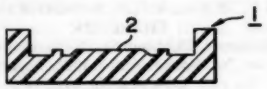
1. A composite comprising (a) an inner material comprising titanium; (b) an outer material comprising iron, nickel or mixtures thereof; and (c) a three-layered metallic interlayer material which is used to diffusion bond said inner material and said outer material, said interlayer material comprising a first layer comprising nickel, said first layer in contact with said outer material, a third layer comprising a Group V-B metal, said third layer in contact with said inner material and a second layer comprising copper, said second layer sandwiched between said first layer and said third layer.

4,514,471

PROCESS FOR THE PREPARATION OF ELECTRON BEAM CURING GYPSUM PANEL

Kenji Sugimoto, Chigasaki, and Osamu Isozaki, Hiratsuka, both of Japan, assignors to Taisei Corporation, Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

Continuation of Ser. No. 410,844, Aug. 23, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,434
Claims priority, application Japan, Aug. 26, 1981, 56-132635
Int. Cl.³ B05D *3/06*
U.S. Cl. 428—703 **7 Claims**



1. A process for preparing gypsum panels coated with a resin composition that is cured by electron beam irradiation, said process comprises the steps of:

(1) adding to a hydrated gypsum slurry formed by adding water to α-type hemihydrate gypsum in an amount of from 28 to 60 parts by weight of water per 100 parts by weight of gypsum

(i) an organic additive selected from acrylic copolymer resin emulsion and melamine resin powder in an amount of from 0.1 to 10 parts by weight of solids per 100 parts by weight of the gypsum in the hydrated gypsum slurry,

(ii) a granular inorganic additive selected from silica sand, calcium carbonate and marble powder having a particle size of from No. 3 or 20 mesh 80% pass to No. 6 or 100 mesh 75% pass according to JIS G-5901 in an amount of from 20 to 80 parts by weight per 100 parts by weight of the gypsum in the hydrated gypsum slurry, and

(iii) an organic or inorganic fibrous material selected from pulp, glass fibers and volcanic ash fibers in an amount of from 0.2 to 3.0 parts by weight per 100 parts by weight of the gypsum in the hydrated gypsum slurry;

(2) casting the resulting slurry to form a first slurry layer int a flat plated mold or a mold having a pattern embossed thereon, the pattern having a thickness of from 0.4 to 6 mm;

(3) defoaming said slurry layer with vibration, then setting and drying to form a first gypsum substrate;

(4) coating on the surface of the gypsum substrate an electron beam curing resin composition consisting essentially of

(i) a reaction product between a functional group-containing base resin and a vinyl monomer having a group capable of effecting an addition or condensation reaction with said functional group, the molecule of said reaction product having an ethylenically unsaturated bond of from 0.3 to 3.0 moles/kg of molecule,

(ii) a cross-linkable oligomer having a molecular weight less than 1000 and have from 2 to 4 polymerizable vinyl groups in an amount of from 1 to 300 parts by weight per 100 parts by weight of the reaction product, and

(iii) at least one of an inorganic pigment, organic pigment and metallic pigment; and thereafter

(5) exposing the resin coating to accelerated electron beam irradiation thereby curing the resin composition on the surface of the gypsum substrate.

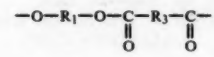
4,514,472

PACKAGING FILM PERMEABLE TO SMOKE CONSTITUENTS AND PACKAGED SMOKED FOODSTUFF

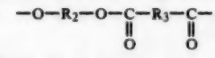
Cornelius M. F. Vrouenraets, Dieren, Netherlands, assignor to Akzo nv, Arnhem, Netherlands

Filed Dec. 1, 1983, Ser. No. 557,000
Claims priority, application Netherlands, Dec. 2, 1982, 8204674
Int. Cl.³ B32B *27/36;* **A22C** *13/00*
U.S. Cl. 428—220 **13 Claims**

1. Packaging film, particularly for foodstuffs, which is permeable to smoke constituents, wherein the film entirely or substantially consists of a thermoplastic copolyester which is built up of recurrent long-chain and short-chain ester units which are joined head-to-tail through ester bonds, the long-chain ester units corresponding to the formula



and the short-chain ester units to the formula:



where R_1 is a divalent radical remaining after removal of the terminal hydroxyl groups from a poly(alkylene oxide) glycol having a molecular weight in the range of 600 to 6000 and a carbon to oxygen ratio of 2.0 to 2.7; R_2 is a divalent radical remaining after removal of the hydroxyl groups from a diol having a molecular weight not higher than 250; R_3 is a divalent radical remaining after removal of the carboxylic acid groups

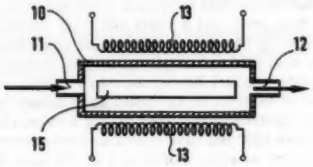
from a dicarboxylic acid; with the proviso that said long-chain ester units amount to 20 to 60% by weight of the copolyester and at least 70% of the R_3 groups are 1,4-phenylene radicals, and the phenol number of the film, expressed in mg per m^2, is at least 20, the thickness of said film being in the range of 1 to 300 microns.

4,514,473

METHOD OF MANUFACTURING AN ELECTRODE FOR AN ELECTROCHEMICAL CELL, AND AN ELECTRODE MANUFACTURED BY THE METHOD

John Atkin, St Médard en Jalles, and Marie-Thérèse Loustau, Bordeaux, both of France, assignors to Societe Anonyme Dite: SAFT, Romainville, France

Filed Jan. 31, 1984, Ser. No. 575,566
Claims priority, application France, Feb. 8, 1983, 83 01923
Int. Cl.³ H01M *2/00*
U.S. Cl. 429—10 **13 Claims**



1. A method of manufacturing an electrode for an electrochemical cell, said electrode comprising an active material and a conductive metal powder, the method comprising the steps of:

preparing an intimate mixture of said powder and said active material in granular form; and

passing the mixture through a pulsed alternating magnetic field, the pulse duration and the interval between pulses being selected to heat the conductive metal powder sufficiently to sinter the powder without deteriorating the grains of active material.

11. An electrode obtained by implementing the method of claim 1, wherein said mixture comprises the following percentages by weight:

10% to 90% metal powder; and

90% to 10% active material.

4,514,474

AIR CATHODE STRUCTURE MANUFACTURE

William R. Momyer, Palo Alto, and Ernest L. Littauer, Los Altos Hills, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

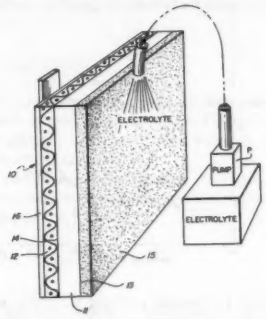
Filed Mar. 11, 1983, Ser. No. 474,502
Int. Cl.³ H01M *12/04*
U.S. Cl. 429—27 **6 Claims**

1. A primary battery comprising an alkali metal anode and an air cathode structure spaced from said anode, said anode and cathode being adapted to contact an aqueous alkaline electrolyte during operation of said battery, said air cathode structure comprising:

a matrix active layer defining an air surface on one face thereof;

a current collector grid on said one face of the matrix active layer; and

a porous, electrically nonconductive polypropylene separator on the opposite face of the matrix active layer between said matrix active layer and said anode, said collector grid and separator being permanently bonded to the matrix active layer, said separator having a preselected porosity providing low IR losses and high resistance to air flow



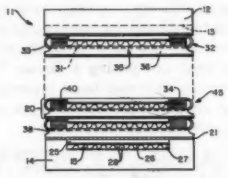
through the matrix active layer to maintain high bubble pressure characteristics thereof.

4,514,475

FUEL CELL SEPARATOR WITH COMPRESSIBLE SEALING FLANGES

Anthony P. Mientek, Glastonbury, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,012
Int. Cl.³ H01M *8/02*
U.S. Cl. 429—35 **20 Claims**



1. A fuel cell separator comprising: a substantially flat, planar, gas-impermeable plate and gas-impermeable seal means along a peripheral edge of said plate projecting from the plane thereof, said seal means including adjustment means accommodating resilient compression of said seal means toward the plane of said plate.

4,514,476

INSTRUMENT FOR INDIRECT OPHTHALMOSCOPY AND ELECTRICAL ENERGY PRODUCING MEANS THEREFOR

James L. Fitzgerald, 20 Mason St., Williamstown, Mass. 01267

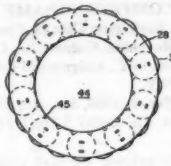
Division of Ser. No. 366,698, Apr. 8, 1982,. This application May 22, 1984, Ser. No. 612,914
Int. Cl.³ H01M *6/46*
U.S. Cl. 429—94 **4 Claims**

1. Electrical energy producing means comprising an annular battery adapted to extend completely around and substantially conform to the outer surface of a support means, said battery including:

(a) first and second annular contact members; and

(b) a plurality of battery cells arranged in spaced relation and disposed between and electrically connected to said contact members, said battery cells being arranged in parallel with the positive terminals of each of said cells

electrically connected to one of said first and second contact members and negative terminals of each of said



cells electrically connected to the other of said contact members.

4,514,477

CASSETTE-TYPE POWER UNIT FOR A MOTOR TOY

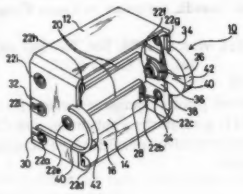
Masao Kobayashi, Tokyo, Japan, assignor to Shinsei Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,654

Claims priority, application Japan, Sep. 25, 1982, 57-145259[U]

Int. Cl.³ H01M *2/02, 2/20*

U.S. Cl. 429—98 **5 Claims**



1. A cassette-type power unit for a motor toy which comprises a rectangular casing provided at its middle part with a partition, at either side of which is arranged each battery chamber for receiving a plurality of batteries in parallel, forming two battery layers; connecting terminals for ensuring all batteries in the battery chambers to be connected in series; contact pieces provided as power terminals on an outer face of the casing and conductive to an extreme pair of and a middle one of said connecting terminals; and holding pieces protruded from the casing at its opposite sides, each of said holding pieces being provided with a flange for serving as a guide and a stopper upon connection to the motor car.

4,514,478

METHOD OF MAKING A POROUS CARBON CATHODE, A POROUS CARBON CATHODE SO MADE, AND ELECTROCHEMICAL CELL INCLUDING THE POROUS CARBON CATHODE

Michael Binder, Brooklyn, N.Y.; Eric R. Petersen, Manchester, N.J.; Charles W. Walker, Jr., Freehold, N.J.; William L. Wade, Jr., Neptune, N.J., and Sol Gilman, Rumson, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 13, 1984, Ser. No. 640,265

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—196 **17 Claims**

1. Method of making a porous carbon cathode for an electrochemical cell, said method including the steps of

(A) wetting the carbon black with a 1:1 to 1:3 mixture of isopropyl alcohol:water,

(B) adding a binding agent thereto,

(C) smearing the resulting stiff paste on a thin expanded metal screen and pressing and rolling to the desired thickness,

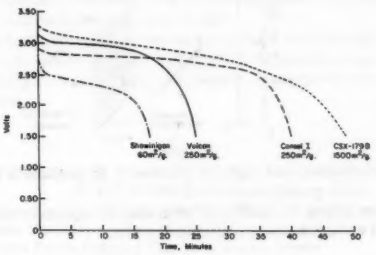
(D) drying the cathode sheet in a vacuum oven at about 100° C. for about one hour while weight is placed above and below the cathode sheet which is sandwiched between two pieces of blotting paper, the total weight applied being sufficient for the cathode to retain structural integrity,

(E) removing the weight and blotting paper and inserting the cathode sheet in an elevated drying oven at about 280° C. for about one hour, and

(F) cooling the cathode sheet between blotting paper, repressing, and rolling.

13. An electrochemical cell comprising lithium as the anode, a solution of 1 molar lithium aluminum chloride in sulfuryl chloride as the electrolyte and a porous carbon cathode, said porous carbon cathode being made by the steps of:

(A) wetting the carbon black with a 1:1 to 1:3 mixture of isopropyl alcohol:water,



(B) adding a binding agent thereto,

(C) smearing the resulting stiff paste on a thin expanded metal screen and pressing and rolling to the desired thickness,

(D) drying the cathode sheet in a vacuum oven at about 100° C. for one hour while a weight is placed above and below the cathode sheet which is sandwiched between two pieces of blotting paper, the total weight applied being sufficient for the cathode to retain structural integrity,

(E) removing the weight and blotting paper and inserting the cathode sheet in an elevated drying oven at 280° C. for one hour, and

(F) cooling the cathode sheet between blotting paper, repressing, and rolling.

4,514,479

METHOD OF MAKING NEAR INFRARED POLARIZERS

Ronald A. Ferrante, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1980, Ser. No. 165,000

Int. Cl.³ G03H *1/18;* **G03C** *5/00;* **C23F** *1/02*

U.S. Cl. 430—2 **6 Claims**

1. A method of making thin film wire grid polarizers for the infrared spectral region comprising the steps of:

coating a layer of material transparent to said spectral region on a substrate with high transmission in said spectral region;

depositing a layer of photoresist over said coating;

exposing said layer of photoresist to a two-beam laser interference pattern where a grating is recorded which is given as functions of the interbeam angle by the grating equation.

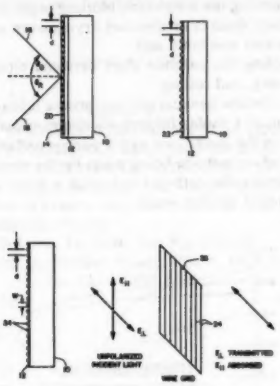
$$\nu = \frac{n(\sin\theta_O + \sin\theta_R)}{\lambda_a}$$

where

ν=spatial frequency,

n=photoresist refractive index, λ_o=exposing wavelength, and

$\theta_o\theta_R$=angle of incidence of object and reference waves measured in the photoresist:



developing said exposed photoresist to produce a surface relief grating; and

ion milling the surface relief grating to reproduce the relief surface in said transparent material.

4,514,480

METHOD OF CONTROLLING TONER CONCENTRATION FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

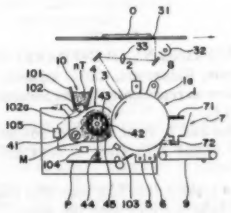
Kenichi Wada, Sakai; Tateki Oka, Toyohashi, and Kenji Tabuchi, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 329,204, Dec. 9, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,776

Claims priority, application Japan, Dec. 19, 1980, 55-181030; Oct. 26, 1981, 56-171617

Int. Cl.[3] **G03G** *13/09*

U.S. Cl. 430—30 **8 Claims**



1. A method of controlling toner concentration in an electrophotographic copying apparatus in which an electrostatic latent image formed on a photosensitive member is subjected to magnetic brush development by impression of a developing bias voltage having the same polarity as that of said electrostatic latent image and which uses a dual component developing material composed of toner particles and magnetic particles which are triboelectrically charged to polarities different from each other, said method comprising the steps of magnetically detecting the amount of said magnetic particles adhering to said photosensitive member, and supplying an amount of replenishing toner according to the amount of said magnetic particles thus detected.

4,514,481

4H-THIOPYRAN-1,1-DIOXIDE AND ELECTROPHOTOGRAPHIC LAYERS AND ELEMENTS COMPRISING SAME

Michael Scozzafava, Rochester; Chin H. Chen, Webster, both of N.Y.; George A. Reynolds, Gainesville, Ga., and Jerome H. Perlstein, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1984, Ser. No. 588,169

Int. Cl.[3] **G03G** *5/06, 5/14*

U.S. Cl. 430—58 **14 Claims**

6. An electrophotographic element comprising a charge-generating electrophotographic layer in electrical contact with a charge-transport layer characterized in that the charge-transport layer comprises a 4H-thiopyran-1,1-dioxide having

(a) an electron withdrawing group in the 4-position and

(b) a half wave potential more positive than −0.5 volts as measured against a saturated calomel electrode.

4,514,482

PHOTOCONDUCTIVE DEVICES CONTAINING PERYLENE DYE COMPOSITIONS

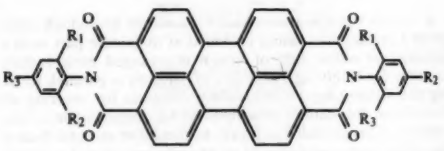
Rafik O. Loutfy, Willowdale, and Cheng-Kuo Hsiao, Mississauga, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1984, Ser. No. 587,483

Int. Cl.[3] **G03G** *5/07*

U.S. Cl. 430—78 **26 Claims**

1. An improved photoresponsive device comprised in the order stated of (1) a supporting substrate, and (2) a photoconductive layer comprised of perylene dye compositions of the following formula:



wherein R_1, R_2, and R_3 are independently selected from the group consisting of alkyl groups and aryl groups.

4,514,483

METHOD FOR PREPARATION OF SELENIUM TYPE ELECTROPHOTOGRAPHIC ELEMENT IN WHICH THE SUBSTRATE IS SUPERFINISHED BY VIBRATING AND SLIDING A GRINDSTONE

Tadashi Matsuura, and Yasuo Kadomatsu, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,601

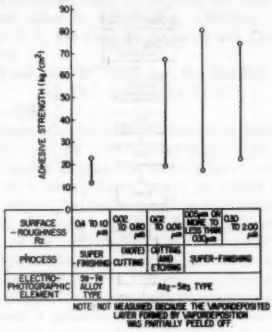
Claims priority, application Japan, Apr. 2, 1982, 57-55114

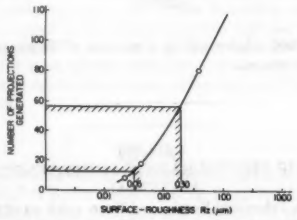
Int. Cl.[3] **G03G** *5/08, 5/04, 5/00*

U.S. Cl. 430—84 **4 Claims**

1. A method for preparing an electrophotographic element which includes an electrically conductive substrate having a metal surface and a photoconductive layer on said substrate, which method comprises the steps of: superfinishing said metal surface of said substrate, using a grindstone effective for superfinishing, by placing said grindstone in contact with said metal surface, vibrating said grindstone, and effecting relative sliding movement between said metal surface and said vibrating grindstone until the surface roughness of said metal surface is from

0.05 μm to less than 0.3 μm whereby to obtain a superfinished metal surface; and then vapor-depositing As_2Se_3 on said superfinished metal surface to form said photoconductive layer consisting essentially of As_2Se_3.





4,514,484

POWDER FOR DEVELOPING LATENT IMAGES AND A METHOD OF PRODUCING THE POWDER

Francois Pon, Danjoutin; Jean-Philippe Voirin, Hericourt, and Andre Lucan, Belfort, all of France, assignors to Compagnie Internationale Pour L'Informatique Cii/Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 65,053, Aug. 9, 1979, abandoned. This application Jan. 6, 1981, Ser. No. 223,005

Claims priority, application France, Sep. 12, 1978, 78 26113

Int. Cl.³ G03G *9/14*

U.S. Cl. 430—106.6 **22 Claims**

1. A dry powder for developing magnetic latent images formed on an image carrying member, said powder comprising finely-divided particles including from 5 to 80% by weight of a ferromagnetic material, each of said particles comprising a core of said material firmly embedded within a polymerized mixture including at least one organic thermoplastic resin which has been previously melted and hot mixed with a silane in a ratio from 0.01 to 10% by weight based on the weight of said powder.

4,514,485

DEVELOPER FOR ELECTROPHOTOGRAPHY HAVING CARRIER PARTICLES, TONER PARTICLES AND ELECTROCONDUCTIVE FINE POWDERS

Hisayuki Ushiyama, Hiratsuka; Hisayuki Ochi; Tatsuo Miyamae, both of Tokyo, and Katsutoshi Wakamiya, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,500

Claims priority, application Japan, Sep. 3, 1981, 56-139164

Int. Cl.³ G03G *9/14*

U.S. Cl. 430—106.6 **8 Claims**

1. An electrophotographic developer which comprises magnetic particles coated with a low surface energy resin, toner particles and electroconductive fine powders from 0.001–1 micron selected from tin oxide and zinc oxide.

4,514,486

METHOD FOR THE FORMATION OF IMAGES

Meizo Shirose, Hino; Kunio Ito, Tama; Hiroyuki Takagiwa; Jiro Takahashi, both of Hachioji, and Kouichi Gunzi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,812

Claims priority, application Japan, Aug. 30, 1982, 57-149053

Int. Cl.³ G03G *5/38*

U.S. Cl. 430—124 **11 Claims**

1. A method for the formation of images comprising the step of thermally fixing a toner image with the use of a fixing device having a heat roller,

wherein said heat roller is of a cylindrical metal whose wall thickness is not more than 2 mm,

said fixing of said toner image being made with the use of a toner which melts at a prescribed temperature for said fixing device and which becomes increasingly elastic with time.

4,514,487

METHOD FOR MANUFACTURING TONER FOR ELECTROPHOTOGRAPHY

Takahira Kasuya; Hideaki Morita; Hiroyuki Takagiwa, and Goichi Yamakawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 215,416, Dec. 11, 1980, abandoned. This application Apr. 14, 1983, Ser. No. 484,692

Claims priority, application Japan, Dec. 17, 1979, 54-162843

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—137 **10 Claims**

1. A method for manufacturing toner for electrophotography which comprises polymerizing a monomer to give a polymer constituent of said toner in the presence of a coloring agent and an anti-offset agent, said anti-offset agent selected from the group consisting of

(a) polyolefins having a weight average molecular weight between 1000 and 45,000,
(b) metal salts of fatty acids,
(c) esters of fatty acids,
(d) partially saponified esters of fatty acids,
(e) higher fatty acids,
(f) higher alcohols,
(g) paraffin wax,
(h) esters of polyalcohols,
(i) fatty acid amides,
(j) silicon varnish,
(k) oligomers of stearylacrylate, and
(l) oligomers of copolymers containing stearylacrylate,

wherein said polymer constituent is a homopolymer or copolymer of one or more of the monomers selected from the classes of

styrenes,
ethylenically unsaturated mono olefins,
vinyl halides,
vinyl esters,
esters of α-methylene aliphatic monocarboxylic acids,
acrylics,
methacrylics,
vinyl ethers,
vinyl ketones,
N-vinyl compounds,
vinyl naphthalenes, and
diolefins

or condensation polymers of

(I) polyalcohols with polycarboxylic acids or
(II) polyamines with polycarboxylic acids.

4,514,488

SILVER SALT DIFFUSION TRANSFER PROCESS USING HYDROXYLAMINE AND PYRAZOLIDINONE DEVELOPING AGENTS

Yoshio Idota, and Noriyuki Inoue, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

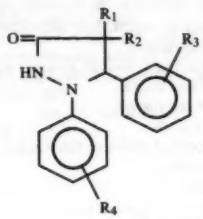
Filed Mar. 28, 1984, Ser. No. 594,235
Claims priority, application Japan, Apr. 4, 1983, 58-58989
Int. Cl.³ G03C *5/54, 5/30, 5/38, 1/42*
U.S. Cl. 430—234 **12 Claims**

7. In a film unit for a silver salt diffusion transfer process comprising a photosensitive element provided with a photosensitive silver halide emulsion layer on a support, an image-receiving element provided with a layer containing silver-precipitating nuclei on a support, and a processing element provided with breakable containers which hold a viscous aqueous alkali solution containing a silver halide solvent, wherein one of said photosensitive element, said image-receiving element and said processing element contains a developing agent, the film unit for a silver salt diffusion transfer process prepared by using a hydroxylamine of the following formula (I) as said developing agent, using a cyclic imide compound as said silver halide solvent, and adding a 1-aryl-3-pyrazolidinone compound represented by the following general formula (II) to at least one of said three elements:

general formula (I):

where R_a is an alkyl, alkoxyalkyl or alkoxyalkoxyalkyl group; R_b is hydrogen, or an alkyl, alkoxyalkyl, alkoxyalkoxyalkyl, or alkenyl group;

general formula (II):



where R_1 and R_2 are the same or different, and are hydrogen or an alkyl of 1 to 3 carbon atoms, and R_3 and R_4 are the same or different, and are hydrogen or an alkyl group of 1 to 2 carbon atoms.

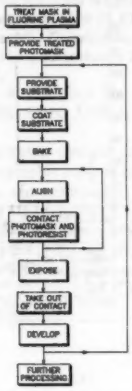
4,514,489

PHOTOLITHOGRAPHY PROCESS

Carlos N. Garcia, Tolleson; Bryan C. Rigg, and Sally A. Tanner, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Shaumburg, Ill.

Filed Sep. 1, 1983, Ser. No. 528,500
Int. Cl.³ G03C *5/00;* **G03F** *9/00*
U.S. Cl. 430—327 **5 Claims**

1. In a process for fabricating a semiconductor device including one or more photolithographic patterning steps utilizing a patterned photomask having an opaque pattern on a surface thereof, the improvement comprising: treating the



surface of said photomask in a mixture of fluorinated carbon and oxygen plasma.

4,514,490

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobuo Seto; Takayoshi Kamio, and Kozo Aoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 8, 1983, Ser. No. 530,437
Claims priority, application Japan, Sep. 8, 1982, 57-156404
Int. Cl.³ G03C *1/46*
U.S. Cl. 430—505 **13 Claims**

1. A color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing therein a coupler represented by the following general formula (I):

Q-B (I)

wherein Q represents a coupler capable of forming a magenta color image upon the coupling reaction with an oxidation product of a developing agent which is a 3-anilino-5-pyrazolone type magenta color forming coupler residue; and B represents a group containing an unsubstituted or substituted methylenedioxybenzene group which is connected to a non-coupling position of Q.

4,514,491

PHOTOSENSITIVE SILVER HALIDE EMULSION

Takeo Koitabashi, Sagamihara; Syoji Matsuzaka, Hino; Yuji Hotta, Hachioji, and Masatoshi Iwata, Akishima, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,481
Claims priority, application Japan, May 6, 1981, 56-67917
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—567 **6 Claims**

1. A photosensitive silver halide emulsion comprising photosensitive silver halide grains which essentially consist of monodisperse globular-shaped grains, wherein the ratio of the standard deviation to the average grain size of said monodisperse globular-shaped grains contained in the emulsion is not more than 0.15.

4,514,492

ELIMINATION OF DEFECTS IN CYSTEINE-SENSITIZED EMULSIONS

Raymond J. LeStrange; John H. Bayless, Jr., both of Hendersonville, and Allan R. Schoenberg, Asheville, all of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1983, Ser. No. 561,525
Int. Cl.[3] G03C *1/34, 1/28*
U.S. Cl. 430—600 9 Claims

1. In a process of coating a gelatino-silver halide emulsion sensitized with cysteine and/or thiazolidine type compounds on a support having at least one subbing layer, and optionally overcoating with an auxiliary layer, in which process the emulsion is subject to desensitization by nonferrous metal contamination, the improvement comprising incorporating in one or more of the subbing, emulsion, or auxiliary layers a quinoline, ethylenediamine, ethanoldiglycine, or acid chelating agent in amounts sufficient to complex nonferrous metals.

9. A photographic film comprising a support, a subbing layer on said support, a gelatino-silver halide emulsion layer, and optionally an auxiliary layer, characterized in that the emulsion is sensitized with cysteine and/or thiazolidine compounds present as emulsion and/or auxiliary layer additions, and wherein a chelating agent with a high formation constant for aluminum, copper or zinc is incorporated into one or more of the subbing, emulsion, or auxiliary layers, said chelating agent being present in an amount sufficient to reduce desensitization defects due to nonferrous metal contaminations of said photographic film.

4,514,493

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH BASE PRECURSOR PARTICLES

Hiroyuki Hirai; Kozo Sato, and Ken Kawata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 22, 1984, Ser. No. 592,197
Claims priority, application Japan, Mar. 25, 1983, 58-50000
Int. Cl.[3] G03C *1/06, 5/24*
U.S. Cl. 430—617 4 Claims

1. A heat-developable light-sensitive material containing fine particles of a substantially water-insoluble base precursor incorporated in a binder.

4,514,494

PHOTOGRAPHIC COLOR MATERIAL INCORPORATING DEVELOPING AGENTS FOR COLOR DEVELOPMENT

Raymond G. Lemahieu, Mortsel, and Wilhelmus Janssens, Aarschot, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Nov. 4, 1983, Ser. No. 548,784
Claims priority, application United Kingdom, Nov. 12, 1982, 8232449
Int. Cl.[3] G03C *7/40, 7/16, 1/02*
U.S. Cl. 430—376 13 Claims

1. A photographic material suited for the production of at least one azine dye image, comprising (a) at least one silver halide emulsion layer or (b) at least one silver halide emulsion layer and at least one non-light-sensitive hydrophilic colloid layer in water-permeable relationship with such an emulsion layer, which contains in at least one such layer:

(1) a heterocyclic hydrazone compound,

(2) a phenol, naphthol or active methylene coupler compound capable of forming an oxidative coupling with compound (1) an azine dye, and

(3) a developing agent which is an electron transfer agent capable of forming a positively charged semiquinone on oxidation with exposed silver halide,

(4) an anti-oxidant which is a reducing agent capable of reducing said semiquinone in acidic medium, and having in the pH range of 2–5 a polarographic half-wave potential (E $\frac{1}{2}$) determined according to the European Convention which is at least 40 mV more negative than the polarographic half-wave potential of the ETA-compound in the same pH range, and

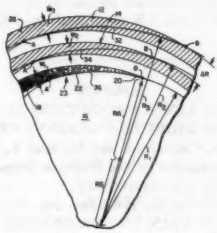
(5) a sufficient amount of an acidic medium for said anti-oxidant that when 1 sq.dm. of said material is immersed in 100 ml. of distilled water for 30 min. said water exhibits an acid pH lower than pH 7.

4,514,495

METHOD FOR TESTING MICROBIAL INTERACTION WITH GROWTH AFFECTING SUBSTANCES

Samuel Schalkowsky, and Ellen R. Schalkowsky, both of Chevy Chase, Md., assignors to Spiral Systems Instruments, Inc., Bethesda, Md.

Filed May 18, 1982, Ser. No. 379,281
Int. Cl.[3] C12Q *1/18, 1/24, 1/29;* C12M *1/26*
U.S. Cl. 435—32 28 Claims



1. A method for investigating the effect of a growth interacting substance on microbial growth comprising:

(a) applying a programmed pattern of a microbe containing solution on an interaction plate;

(b) applying a programmed solution of the growth interacting substance on the interaction plate in the same pattern as the microbial solution in contact with the microbes;

(c) incubating the interaction plate for a time sufficient to produce visible microbial colonies; and

(d) detecting the presence or absence of visible microbial colonies on the interaction plate at a point of interest where the growth interacting substance has contacted the microbe containing solution and directly determining the potency of the growth interacting substance at the point of interest on the incubated interaction plate by correlating the position of the point of interest with the programmed volume of the growth interacting substance at that point of interest.

4,514,496

PROCESS FOR PRODUCING ALCOHOL BY FERMENTATION WITHOUT COOKING

Hajime Yoshizumi, Takatsuki; Nobuya Matsumoto; Osamu Fukuda, both of Ibaraki, and Osamu Fukushi, Usuki, all of Japan, assignors to Suntory Limited, Osaka, Japan

Continuation of Ser. No. 326,283, Dec. 1, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,995
Claims priority, application Japan, Dec. 16, 1980, 55-178523; May 7, 1981, 56-68974; May 28, 1981, 56-82217; Jun. 1, 1981, 56-84823
Int. Cl.[3] C12P *7/06, 7/14;* C12C *7/00;* C12G *3/00*
U.S. Cl. 435—162 34 Claims

1. A process for producing a fermented mash containing from 12.2 to 17.1 V/V% of alcohol, which comprises mixing at least one non-heated raw cereal with a mashing liquor in a weight ratio (weight of said raw cereal: weight of mashing liquor) of from 1:3.4 to 1:1.8 to form a slurry; thereafter without heating the slurry, without adjusting the pH of the slurry and without adding liquefying enzyme, adding a saccharifying

enzyme preparation derived from a microorganism source in an amount of at least 3.5 units of saccharifying titer per gram of said raw cereal on a wet basis to the slurry, adding an alcoholic fermenting yeast having an initial concentration of at least 2×10^7 cells/ml of slurry, and fermenting the slurry at a pH of from 4.0 to 5.0, at a temperature of 25° to 35° C. for 90 to 120 hours.

4,514,497

MODIFIED LIVE PSEUDORABIES VIRUSES

Malon Kit, and Saul Kit, both of Houston, Tex., assignors to Novagene, Ltd. and Baylor College of Medicine, both of Houston, Tex.

Filed Dec. 30, 1983, Ser. No. 567,018

Int. Cl.³ C12N *7/00;* **A61K** *39/205*

U.S. Cl. 435—235 **39 Claims**

1. A temperature-resistant pseudorabies virus which fails to produce any functional TK as a result of mutagen-induced mutation.

21. A temperature-resistant pseudorabies virus which fails to produce any functional TK as a result of a deletion in the tk gene.

4,514,498

HYBRID CELL LINES PRODUCING MONOCLONAL ANTIBODIES DIRECTED AGAINST TREPONEMA

John R. Kettman, Carrollton, and Michael V. Norgard, Plano, both of Tex., assignors to The Board of Regents, The University of Texas System, Austin, Tex.

Filed May 26, 1982, Ser. No. 381,929

Int. Cl.³ C12N *5/00, 15/00;* **C07G** *7/00*

U.S. Cl. 435—240 **9 Claims**

1. A composition of matter consisting essentially of a continuous murine hybrid cell line that produces monoclonal antibody against an antigenic determinant of *Treponema pallidum,* which cell line is formed as a fusion between a murine myeloma cell and a differentiated murine lymphoid cell immunized with *Treponema pallidum* antigen.

4,514,499

CELL CULTURE USING A MONOLITHIC SUPPORT

Lee A. Noll, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 4, 1983, Ser. No. 464,040

Int. Cl.³ C12N *5/00*

U.S. Cl. 435—240 **18 Claims**

1. An immobilized cell composite comprising:

(a) a high surface area monolithic support having an inlet and an outlet end, a multiplicity of mutually parallel channels passing therethrough, the channels having walls formed of a medium-insoluble, non-toxic, composition and the support having at least about 20 channels per square inch of cross-sectional area; and

(b) a population of plant or animal tissue cells anchored to the porous channel walls.

4,514,500

CELL GROWTH ON LIQUID-LIQUID INTERFACES

Ivar Giaever, Schenectady, and Richard C. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

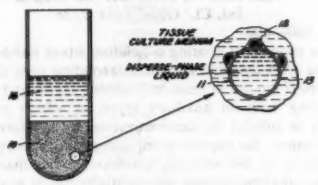
Filed Nov. 19, 1982, Ser. No. 442,981

Int. Cl.³ C12N *5/02, 5/00;* **C12R** *1/91*

U.S. Cl. 435—241 **12 Claims**

1. The method of growing cells in tissue culture medium wherein the cells attach, spread and divide comprising the steps of

(a) preparing a heterogeneous system in which a first liquid is dispersed in the form of a large number of small droplets in a second liquid; said second liquid being a sterile, aqueous tissue culture medium containing proteins; said first liquid being non-toxic to living cells, being relatively immiscible with said second liquid and containing sufficient surface active polar additive previously dissolved therein to electrically charge the surface of said droplets to a charge density in excess of about 10 charges per square nanometer whereby proteins from said culture medium coat said droplets;



(b) bringing living cells into contact with said protein-coated droplets; and

(c) permitting sufficient time to elapse with suitable conditions of temperature, pH, carbon dioxide concentration and oxygen tension prevailing in said system for cell growth to occur over said protein-coated droplets.

4,514,501

METHOD FOR CULTIVATION OF MICROORGANISM

Yukio Kita, Tokyo; Kazuo Koide, Urayasu, and Kouki Horiko, Tokyo, all of Japan, assignors to Oji Paper Company, Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,194

Claims priority, application Japan, Feb. 21, 1981, 56-23672

Int. Cl.³ C12N *1/24, 1/20;* **C02F** *3/34;* **D21C** *11/00*

U.S. Cl. 435—251 **2 Claims**

1. A method for cultivating a microorganism comprising the steps of:

inoculating at least one microorganism which grows well under alkaline conditions and is selected from the group consisting of *Bacillus* SP. FERM-P No. 5861 and SP. FERM-P No. 5862, *Arthrobacter* SP. FERM-P No. 5863 and SP. FERM-BP No. 88, *Corynebacterium* SP. FERM-BP Nos. 89 and 90, and *Brevibacterium* FERM-BP Nos. 91 and 92, into a culture medium containing, as a carbon source, extracted liquor or spent liquor derived from alkaline pulping; and

cultivating the inoculated microorganism in the culture medium at a pH of 8.0 to 12.5 under an aerobic condition; whereby organic acids contained in the extracted liquor or spent liquor are utilized.

4,514,502

COMPOSITE PLASMID

Kiyoshi Miwa, Matsudo; Mahito Terabe, Yokohama; Koichi Ito, Kawasaki; Masaaki Ishida, Kawasaki; Kazuhiko Matsui, Kawasaki; Shigeru Makamori, Yokohama, and Konosuke Sano, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 386,980

Claims priority, application Japan, May 4, 1982, 57-74845

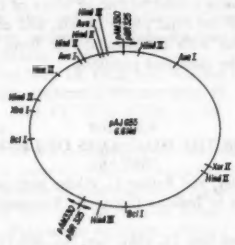
Int. Cl.³ C12N *1/20, 15/00, 1/00;* **C12R** *1/15*

U.S. Cl. 435—253 **18 Claims**

1. A composite plasmid which comprises

(A) a minimum genetic region, necessary for controlling the capability of gene propagation in a *Coryneform glutamic* acid-producing bacterium, derived from a plasmid (a)

selected from the group consisting of pAM 330, pAM 286 and pHM 1519, and



(B) a gene fragment derived from a plasmid (b) capable of propagating in *Escherichia coli* or *Bacillus subtilis* having at least a region expressing drug resistance.

4,514,503

REAGENT AND PROCESS FOR DETECTING FURFURAL IN PETROLEUM PRODUCTS

Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton Norwich Products, Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,833
Int. Cl.³ G01N *21/78, 33/26*
U.S. Cl. 436—60 **25 Claims**

11. A process for detecting the presence of furfural in a petroleum product containing same, said process comprising admixing in a suitable containier with a major quantity of said petroleum product a minor quantity of a first component of a two-component liquid reagent, said first component comprising on a weight basis from about 18 to about 25 percent of an acid selected from the group consisting of citric acid, lactic acid, formic acid and phosphoric acid, from about 35 to about 45 percent of diethylene glycol and from about 35 to about 45 percent of ethanol, adding to said admixture of petroleum product and said first component a minor quantity of the second component of said liquid reagent, said second component comprising on a weight basis from about 15 to about 22 percent of a primary amine selected from the group consisting of aniline, meta aminophenol, para anisidine, meta toluidine and para toluidine, from about 35 to about 45 percent of diethylene glycol, from about 35 to about 45 percent ethanol and from about 1 to about 2 percent of an antioxidant, with the proviso that when in the first component the amine is aniline then in the second component the acid is selected from the group consisting of citric acid, lactic acid and formic acid, shaking the resultant mixture and allowing the mixture to stand and separate into two layers whereupon a red color characteristic of furfural is visible in the lower layer.

4,514,504

MONITORING METHOD FOR POLYACRYLIC ACIDS IN AQUEOUS SYSTEMS

Alan M. Rothman, Jenkintown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 22, 1983, Ser. No. 516,613
Int. Cl.³ G01N *1/00, 31/06;* **B01D** *15/00, 12/00*
U.S. Cl. 436—85 **12 Claims**

8. A method for quantitatively determining the concentration of polyacrylic acids and organophosphonates in an aqueous system comprising:

(a) adjusting the pH of said aqueous system to suppress ionization of said polyacrylic acids;

(b) selectively adsorbing said ion suppressed polyacrylic acids on a non-polar adsorbent and separating said organophosphonates and aqueous solution from said adsorbed, ion suppressed polyacrylic acids;

(c) collecting the non-adsorbed aqueous system containing said organophosphonates;

(d) desorbing said adsorbed, ionization suppressed, polyacrylic acids from said adsorbent with a suitable displacement fluid;

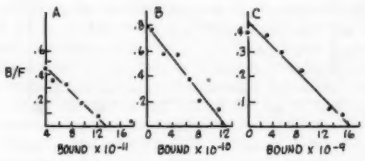
and subsequently measuring the concentration of the desorbed polyacrylic acids and the non-adsorbed organophosphonates separately.

4,514,505

MONOCLONAL ANTIBODY MIXTURES AND USE THEREOF FOR ENHANCED SENSITIVITY IMMUNOASSAYS

Robert E. Canfield; Paul H. Ehrlich, both of New York, N.Y., and William R. Moyle, Piscataway, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 21, 1982, Ser. No. 380,959
Int. Cl.³ G01N *33/54, 33/74, 33/76*
U.S. Cl. 436—500 **16 Claims**



1. An immunoassay for an antigen providing enhanced sensitivity which comprises contacting the antigen under suitable conditions with effective assaying amounts of each of at least two monoclonal antibodies which bind to different antigenic sites on the antigen and which are capable under appropriate conditions in a totally liquid phase of forming a stable complex which includes the antigen and all of the monoclonal antibodies, the monoclonal antibodies being further characterized in that they form a stable complex with the antigen when subjected to gel electrophoresis in the presence of the antigen and when subjected to gel filtration chromatography in the presence of the antigen, and detecting the complex which results from contacting the antigen with the monoclonal antibodies.

4,514,506

METHOD FOR THE IDENTIFICATION AND PURIFICATION OF HUMAN LUNG TUMOR-ASSOCIATED ANTIGENS (HLTAA) AND CLINICAL DETECTION AND DETERMINATION OF THESE ANTIGENS

James A. Braatz, Beltsville; Kenneth R. McIntire, Kensington, and Gerald L. Princler, Frederick, all of Md., assignors to The Government of the United States as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 351,588, Feb. 23, 1982,. This application Jan. 28, 1983, Ser. No. 462,022
Int. Cl.³ G01N *33/54, 33/56, 33/58*
U.S. Cl. 436—518 **17 Claims**

1. A substantially purified human lung tumor-associated antigen (hLTAA) associated with lung tumors comprising small cell carcinomas, large cell undifferentiated carcinomas, squamous cell carcinomas and adenocarcinomas, characterized by

a diffusion coefficient ($D_{20,w}$) of $4.2–4.3\times10^{-7}$ cm^2sec^{-1}, a sedimentation coefficient ($S_{20,w}$) of 4.5–4.6 S; and a Stokes radius of 51 Å;

immunological reactivity with a xenoantiserum containing heterologous species antibodies raised in a heterologous

species animal as an immune response to a crude extract of at least one of said lung tumors; and

no antigenic cross-reactivity with α_1-antichymotrypsin.

4,514,507

ASSAY FOR INTERFERON

David S. Secher, 2, Nightingale Ave., Cambridge CB1 4SQ, England

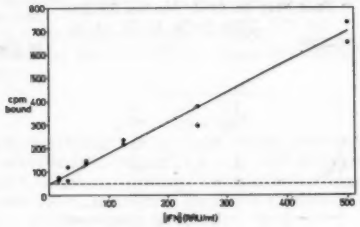
PCT No. PCT/GB81/00239, § 371 Date Jun. 28, 1982, § 102(e) Date Jun. 28, 1982, PCT Pub. No. WO82/01773, PCT Pub. Date May 27, 1982

PCT Filed Nov. 9, 1981, Ser. No. 396,911

Claims priority, application United Kingdom, Nov. 7, 1980, 8035884

Int. Cl.³ G01N *33/54*

U.S. Cl. 436—518 **18 Claims**



1. An immunoassay for interferon involving an interferon antibody attached to a solid support, and a labelled monoclonal antibody, each of which antibodies is capable of specifically binding to at least one antigenic determinant of interferon, said process comprising the steps of:

placing a sample to be assayed in contact with the solid support allowing immunocomplexes to form between interferon in the sample and the interferon antibody bound to the solid support,

placing the labelled monoclonal antibody in contact with the solid support allowing immunocomplexes to form between interferon bound to the solid and the labelled monoclonal antibody, and

estimating the immunocomplexes.

7. An immunoassay reagent kit for use in the assay of interferon comprising:

a first container containing a first antibody, and

a second container containing a second antibody, each of which antibodies is capable of specifically binding to an antigenic determinant of interferon, at least one of which antibodies is a monoclonal antibody and one of which antibodies is a labelled antibody.

4,514,508

ASSAYING FOR A MULTIPLICITY OF ANTIGENS OR ANTIBODIES WITH A DETECTION COMPOUND

Steven Hirschfeld, New York, N.Y., assignor to Biond Inc., New York, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,263

Int. Cl.³ G01N *33/54, 33/58*

U.S. Cl. 436—518 **19 Claims**

1. A method for assaying the presence or level of a multiplicity of antigens or haptens in a liquid complex mixture comprising the steps of:

(a) adding the test sample containing the antigens or haptens to a solid phase matrix to form antigen-antibody complexes, said matrix having attached to it in identifiable positions antibodies or portions thereof, said antibodies or portions thereof directed against the antigens or haptens;

(b) adding to the mixture formed in step (a) a known amount of labeled Detection Compound for antigen-antibody complexes; and

(c) measuring the amount of labeled Detection Compound which remains bound to one or more of the identifiable positions of the solid phase matrix, and correlating that measurement with the presence or level of antigen or hapten in the identified positions.

4,514,509

METHOD FOR THE DIAGNOSIS OF LEGIONNAIRES' DISEASE

Richard B. Kohler, and Arthur C. White, both of Indianapolis, Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Sep. 21, 1981, Ser. No. 304,274

Int. Cl.³ G01N *33/56;* C12Q *1/20*

U.S. Cl. 436—518 **10 Claims**

1. A method for the detection of antigens of the organism *Legionella pneumophila* in a human donor-patient, which comprises the steps of:

(a) inoculating a culture medium with *Legionella pneumophila* thereby forming a Legionella innoculated culture medium;

(b) incubating said Legionella inoculated culture medium thereby producing *Legionella pneumophila* organisms;

(c) removing, incubating and heating by auto-claving said Legionella organisms in a buffer thereby forming suspended Legionella organisms;

(d) inoculating a mammal with said suspended Legionella organisms thereby producing anti-Legionella immunoglobulin G in said mammals;

(e) recovering anti-Legionella immunoglobulin G from the mammal;

(f) isotopically labelling at least some of the anti-Legionella immunoglobulin G thereby forming isotopically-labelled anti-Legionella immunoglobulin G;

(g) forming a layer capable of binding *Legionella pneumophila* antigen but substantially incapable of adsorbing anti-Legionella immunoglobulin G on a test surface thereby forming an antigen binding test surface;

(h) depositing a test sample obtained from a donor-patient on the antigen binding test surface thereby forming a test sample-treated test surface;

(i) forming a layer of the isotopically-labelled anti-Legionella immunoglobulin G on said test sample-treated test surface thereby forming a radioactively labelled surface in which the emitted radiation is proportional to the presence of *Legionella pneumophila* antigen; and

(j) measuring the radiation emitted by the radioactively-labelled surface thereby obtaining a test value indicative of the presence of *Legionella pneumophila.*

4,514,510

HYDROGEN ENRICHED WATER SWELLABLE CLAY HAVING REDUCED ACID DEMAND AND STABLE AT LOW PH

William Alexander, Naperville, Ill., assignor to American Colloid Company, Skokie, Ill.

Filed Sep. 8, 1983, Ser. No. 530,430

Int. Cl.³ B01J *13/00;* C04B *33/04*

U.S. Cl. 501—148 **19 Claims**

1. A water swellable clay composition having a pH of 9–10, a weight ratio of Aluminum to Magnesium of 0.5 to 5.5, and meeting existing acid demand specifications for Magnesium Aluminum Silicate comprising a montmorillonite and at least one other clay selected from the group consisting of saponite, hectorite, beidellite, and nontronite wherein at least one of said clays is hydrogen enriched by contacting said clay with a hydrogen ion exchange resin.

4,514,511
PREPARATION OF SPHEROIDAL ALUMINA PARTICULATES

Roland Jacques, Ales, and Thierry Dupin, Garges/les/Gonesse, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 19, 1983, Ser. No. 496,138
Claims priority, application France, May 19, 1982, 82 08774
Int. Cl.³ B01J *37/00, 21/04*
U.S. Cl. 502—8 **11 Claims**

1. A process for the preparation of spheroidal alumina particulates, which comprises drop coagulating an aqueous suspension or dispersion of alumina, or an aqueous solution of a basic aluminum salt, said suspension, dispersion or solution comprising an oil-in-water emulsion, wherein the viscosity of said emulsion ranges from 100 and 800 centipoises, said suspension, dispersion or solution further comprising an alumina filler, with the proportion of the filler being up to 90% by weight, expressed in Al_2O_3, with respect to the total alumina content, and thence recovering, drying and calcining the gelled particulates which result.

4,514,512
METHOD FOR THE PRODUCTION OF SOLID TITANIUM TRICHLORIDE CATALYST

Akinobu Shiga, Ehime; Yukio Naito, Chiba; Toshio Sasaki; Junpei Kojima, both of Ehime; Hiroshi Yoshioka, Saitama, and Akira Nunose, Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 31, 1983, Ser. No. 480,648
Claims priority, application Japan, Feb. 19, 1982, 57-26508
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—107 **10 Claims**

1. A method for the production of a solid titanium trichloride catalyst by the steps of (1) preparing a titanium trichloride composition comprising a solid reduction product obtained by reducing titanium tetrachloride with an organoaluminum compound represented by the formula, $R^1_nAlY_{3-n}$ (wherein R^1 is a hydrocarbon group having 1 to 18 carbon atoms; Y is a halogen atom or a hydrogen atom; and n is a number satisfying the equation, $1<n\leqq 3$), or a solid product obtained by thermally treating said solid reduction product at a temperature of not more than 150° C.; (2) reacting said titanium trichloride composition comprising said solid reduction product obtained in step (1) in an aromatic hydrocarbon solvent with a mixture consisting of a halogen compound represented by the formula, X_2 (wherein X is Cl, Br, or I), or an interhalogen compound represented by the formula, XX'_a (wherein X and X' are each Cl, Br, or I, and a is 1 or 3), and an ether compound represented by the formula, $R^2—O—R^3$ (wherein R^2 and R^3, which may be the same or different, are each an alkyl group having 1 to 10 carbon atoms); (3) subjecting the resulting reaction mixture to solid-liquid separation; and (4) washing the resulting solid product with an inert hydrocarbon solvent, which method is characterized by using an aliphatic hydrocarbon as a washing medium during at least the first of washing treatments performed subsequently to said solid-liquid separation of said reaction mixture.

4,514,513
PREACTIVATED CATALYST FOR PRODUCING α-OLEFIN POLYMERS

Akihiro Sato, Chiba; Kazutsune Kikuta, Ichiharashi; Kenji Matsuda, Ichiharashi; Toshihiro Uwai, Ichiharashi, and Tohru Hanari, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 497,077, May 23, 1983, abandoned, which is a continuation of Ser. No. 243,691, Mar. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 149,684, May 14, 1980, Pat. No. 4,309,521. This application Apr. 12, 1984, Ser. No. 599,741
Claims priority, application Japan, Feb. 27, 1980, 55-23785
Int. Cl.³ C08F *4/64*
U.S. Cl. 502—112 **18 Claims**

1. A preactivated catalyst for producing alpha-olefin polymers obtained by the steps which comprise:

(a) reacting one mol of an organoaluminum compound (O-Al_1) with 0.1 to 8 mols of an electron donor (ED_1) in a solvent at a temperature of −20° to 200° C., to obtain a solid product (I);

(b) reacting this solid product (I) with $TiCl_4$ in a ratio (Al/Ti) of the number of atoms of aluminum to that of Ti in $TiCl_4$, of 0.05 to 10, at a temperature of 0° to 200° C., and thereafter removing the resulting liquid portion and $TiCl_4$ freed by washing, to obtain a solid product (II);

(c) reacting 100 g of this solid product (II) with 10 to 1,000 g of an electron donor (ED_2) and 10 to 1,000 g of an electron acceptor at a temperature of 40° to 200° C., to obtain a solid product (III) having an X-ray diffraction spectrum with a line corresponding to the plane of lattice distance of 4.80 to 5.10 Å and having no infrared absorption spectrum in the vicinity of 3,450 cm^{-1};

(d) combining 1 g of this solid product (III) with 0.1 to 500 g of an organoaluminum compound (O-Al_2) and subjecting the resulting combination to polymerization treatment with 0.01 to 5,000 g of an alpha-olefin; and

(e) adding to 1 g of said solid product (III) and 0.1 to 500 g of said organoaluminum compound (O-Al_2), either prior to or subsequent to said polymerization treatment with 0.01 to 5000 g of an alpha-olefin, 0.05 to 10 g of a reaction product (RP) obtained by reacting (1) 1 mol of an organoaluminum compound (O-Al_3) with (2) 0.01 to 5 mols of an electron donor (ED_3), (3) such reaction being carried out at a temperature of −30° to 100° C. to thereby obtain a prepreactivated catalyst.

5. A preactivated catalyst according to claim 1 wherein said organoaluminum compounds (O-Al_1), (O-Al_2) and (O-Al_3) may be the same or different and are expressed by the general formula $AlR_nR'_{n'}X_{3-(n+n')}$ wherein R and R' each represent an alkyl, aryl, alkaryl, cycloalkyl or alkoxy group; X represents fluorine, chlorine, bromine or iodine; and n and n' each represent an optional number of $0<n+n'\leqq 3$.

4,514,514
PROCESS AND VANADIUM CATALYST FOR OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 28, 1983, Ser. No. 489,445
Int. Cl.³ C08F *4/68*
U.S. Cl. 502—121 **20 Claims**

1. A process for preparing a solid particulate catalyst component comprising (A) reacting reactants comprising

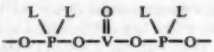
(1) a vanadium compound having a V—X linkage where X is halogen,

(2) an organoaluminum compound selected from those having the formula AlR'_nX_{3-n} wherein X is halogen, each R' is individually selected from the group consisting of alkyl radicals, aryl radicals, cycloalkyl radicals, and alkoxy radicals, and n is a number from 1 to 3, and

(3) an organophosphorus compound having a P—L linkage wherein L is selected from the group consisting of alkyl

radicals, alkoxy radicals, aryl radicals, aryloxy radicals, cycloalkyl radicals, cycloalkyloxy radicals, cycloalkylaryl radicals, alkylamino radicals, and haloalkyloxy radicals, or

(B) reacting reactants comprising said organoaluminum compounds as defined for (2) and a composition having functionality of the formula



wherein each L is individually selected from the group consisting of the L's as defined for (3), under suitable conditions in a liquid which allows the product of the reaction to form as a particulate solid, said liquid consisting essentially of nonaromatic halocarbon.

4,514,515

PROCESS FOR MANUFACTURING A CATALYST COMPRISING RHODIUM AND AT LEAST ONE METAL SELECTED FROM THE GROUP CONSISTING OF TIN, GERMANIUM AND LEAD AND THE CATALYST PRODUCED BY THE PROCESS

Christine Travers, Rueil-Malmaison; Trinh D. Chan, Le Vesinet; Roger Snappe, Sevres, and Jean-Paul Bournonville, Chatou, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 497,631, May 24, 1983, Pat. No. 4,456,775. This application Apr. 6, 1984, Ser. No. 597,288

Claims priority, application France, May 24, 1982, 8209099

Int. Cl.³ B01J *21/04, 21/08, 23/62*

U.S. Cl. 502—154 **25 Claims**

1. A process for manufacturing a catalyst comprising rhodium and at least one of tin, germanium and lead, comprising admixing a carrier with a rhodium compound and at least one metal compound selected from the group consisting of the alkyl, cycloalkyl and aryl tin, germanium and lead compounds.

4,514,516

METHOD FOR MANUFACTURE OF AMS-1B CRYSTALLINE BOROSILICATE MOLECULAR SIEVE WITH LOW SODIUM CONTENT

Imre Puskas, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 297,174, Aug. 28, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 528,847

Int. Cl.³ C01B *35/10*

U.S. Cl. 502—202 **9 Claims**

1. A method to prepare AMS-1B crystalline borosilicate molecular sieve containing a low sodium content comprising reacting under crystallization conditions an aqueous mixture consisting essentially of sources for a silicon oxide, a boron oxide, sodium cation and an amine selected from the group consisting of methylamine and dimethylamine, wherein the ratio of moles of amine to sodium cation is about 1 to about 10.

3. The method of claim 1 wherein the source of sodium cation is sodium hydroxide.

4,514,517

SUPPORTED, SELF-PROMOTED MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS FORMED FROM BIS(TETRATHIOMETALLATE) PRECURSORS, AND THEIR PREPARATION

Teh C. Ho, Scotch Plains, and Wie-Hin Pan, Fanwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 29, 1983, Ser. No. 518,360

Int. Cl.³ B01J *27/02, 31/12*

U.S. Cl. 502—220 **19 Claims**

1. As a composition of matter, supported, self-promoted catalysts obtained by compositing a pre-selected quantity of porous, refractory inorganic oxide with one or more carbon-containing, bis(tetrathiometallate) precursor salts selected from the group consisting of $(NR_4)_2[M(WS_4)_2]$, $(NR_4)_x[M(MoS_4)_2]$ and mixtures thereof and heating said composite in a non-oxidizing atmosphere in the presence of sulfur and hydrogen at elevated temperature for a time sufficient to form said catalyst, wherein (NR_4) is a carbon-containing, substituted ammonium cation, wherein R is selected from the group consisting of (a) alkyl groups, aryl groups and mixture thereof and (b) mixture of (a) with hydrogen, wherein promoter metal M is covalently bound in the anion and is Ni, Co or Fe and wherein x is 2 if M is Ni and x is 3 if M is Co or Fe and wherein promoter metal M is tetracoordinated with four sulfur atoms with each of the two tetrathiometallate groups providing two of each of the said four sulfur atoms.

4,514,518

FLUORIDE-SUBSTITUTED COBALT SPINELS

Walter W. Henslee, and Stephen I. Foster, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 247,428, Mar. 25, 1981, abandoned. This application Apr. 22, 1982, Ser. No. 370,700

Int. Cl.³ C01G *51/04, 51/08;* **B01J** *23/74*

U.S. Cl. 502—229 **7 Claims**

1. The fluoride-substituted cobalt spinel compounds conforming substantially to the formula $Co_3O_xF_y$,

where $x+2y=4$ and where y is an amount, not zero, such that $F \leqq 2$ weight percent of the compound,

said cobalt oxide spinels being characterized as being substantially unstable at temperatures above 600° C.

4,514,519

CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 403,257, Jul. 29, 1982, Pat. No. 4,439,627. This application Jan. 16, 1984, Ser. No. 571,264

Int. Cl.³ B01J *23/02*

U.S. Cl. 502—243 **6 Claims**

1. A catalyst comprising 0.005 to 5 wt. % of iron, 0.1 to 10 wt. % of tungsten, and 0.01 to 2 wt. % of an alkali or alkaline earth component on a carrier material.

4,514,520

CATALYST AND METHOD OF ITS PREPARATION

Jan Uytterhoeven, Leuven; Pierre Jacobs, Gooik; Ludo Adriaensen, Deerlijk, and Jan Geerts, Sint-Katelijne-Waver, all of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 4, 1983, Ser. No. 548,826

Claims priority, application Netherlands, Nov. 18, 1982, 8204478

Int. Cl.³ B01J *23/72, 23/74*

U.S. Cl. 502—337 **16 Claims**

1. A catalyst comprising a metallic carrier having a catalytically active metal-containing surface layer, the catalytic metal being other than a noble metal, whereby the catalytically active surface layer is formed out of a homogeneous metallic carrier by oxidizing in an oxidizing gas and subsequently reducing the surface of the metallic carrier at a temperature at which the active metal is substantially not sintered, whereby the thus prepared catalytically active surface layer is in the form of a catalytically active metal-containing spongy mass, characterized in that the carrier is a web or felt of fibers with a diameter between 4 and 100 microns.

4,514,521

MANUFACTURE OF OXYGENATED COMPOUNDS

David W. Smith, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 323,002, Nov. 19, 1981, Pat. No. 4,429,056, which is a continuation of Ser. No. 142,287, Apr. 21, 1980, abandoned. This application Jan. 10, 1983, Ser. No. 456,910

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.³ C07C *27/06, 31/08*

U.S. Cl. 518—700 46 Claims

1. A process for forming acetaldehyde in a first stage reaction and then reducing said aldehyde to form ethanol in a second stage reaction which comprises reacting carbon monoxide and hydrogen at a temperature of from about 150° to about 300° C. and superatmospheric pressure in the presence of a catalyst system comprising (a) a preformed ruthenium carbonyl complex or a ruthenium carbonyl complex formed in situ by reaction between ruthenium metal and carbon monoxide or a ruthenium compound which undergoes reaction with carbon monoxide to provide said ruthenium carbonyl complex and (b) a source of halide anion, said catalyst system being present at least during said first reaction stage.

4,514,522

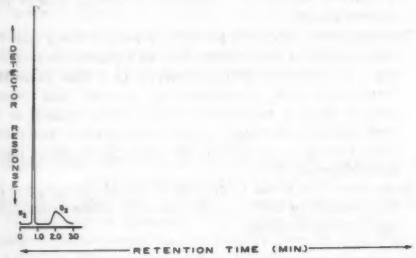
OXYGEN SORBENT

Robert E. Sievers, and John N. Gillis, both of Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

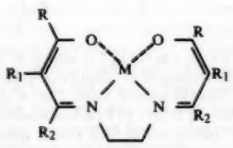
Filed Jul. 27, 1984, Ser. No. 635,320

Int. Cl.³ C08J *9/40*

U.S. Cl. 521—53 9 Claims



1. A metallic complex of a Schiff base of the general formula



wherein R, R_1 and R_2 are selected from the group consisting of hydrogen, lower alkyl containing from 1 to 10 carbon atoms, and polyfluoromoieties containing from 1 to 10 carbon atoms bonded to a porous synthetic organic polymer containing a nitrogen functionality.

4,514,523

METHOD OF PRODUCING POLYESTER FOAMS USING BOROHYDRIDE DISPERSIONS

Thomas M. Burton, and Helena Z. Kucharska, both of Sarnia, Canada, assignors to Fiberglas Canada Inc., Toronto, Canada

Filed May 4, 1984, Ser. No. 607,046

Claims priority, application Canada, Dec. 12, 1983, 443119

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—85 20 Claims

1. A method of making a foamed polyester resin comprising mixing a thermosetting liquid, unsaturated polyester, which is a condensation product of a polyhydric alcohol and a polycarboxylic acid, at least one of which is ethylenically unsaturated, with a liquid borohydride foaming agent selected from a liquid borohydride complex, a borohydride complex dissolved in an organic liquid medium and an inorganic borohydride salt dispersed in an organic rubber liquid medium which medium is at least substantially non-reactive with the borohydride salt.

4,514,524

INTUMESCENT FLEXIBLE POLYURETHANE FOAM

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 13, 1984, Ser. No. 630,460

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—107 20 Claims

1. In a process for preparing a flexible, resilient, flame retardant and intumescent polyurethane foam by the reaction of a polyether polyol and an organic polyisocyanate wherein the improvement comprises:

adding to the polyurethane forming reactants at least one blowing agent, at least one surfactant, at least one catalyst and a flame and dripping ember retardant effective amount of an additive combination comprising:

i. a polyester polyol,

ii. an halogenated flame retardant, and

iii. water or alcohol soluble uncrosslinked urea-formaldehyde resin which is unreactive with said organic polyisocyanate.

4,514,525

PROCESS FOR PREPARING SMOKE-RETARDANT POLYISOCYANURATE FOAM

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,527

Claims priority, application Japan, Mar. 13, 1975, 50-30601

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—112 12 Claims

1. A process for preparing a smoke retardant polyisocyanurate foam, which comprises: reacting an organic polyisocyanate in the presence of a blowing agent, an isocyanate trimerization catalyst and an amount of an organosilicone surfactant having a silicon content of from 4–22% such that the silicon content of the foam product ranges from 1.5% to 5%, and selected from the group consisting of an organopolysiloxanepolyoxyalkylene copolymer, a polyvinyl silane having a polyoxyalkylene side chain and modified products thereof wherein the mole % of the ethylene oxide units of the polyoxyalkylene moiety of the organosilicone surfactant is greater than 40 mole % based on the total number of ethylene oxide and propylene oxide units in said polyoxyalkylene moiety.

4,514,526

STORAGE-STABLE TRIS(HYDROXYALKYL)ISOCYANURATE POLYOL DISPERSIONS, PROCESS FOR THEIR PREPARATION AND THEIR UTILIZATION

Matthias Marx, Bad Durkheim; Helmut Ganss, Ludwigshafen, and Wolfram Frank, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,512

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332251

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—166 **11 Claims**

1. Storage-stable tris(hydroxyalkyl)isocyanurate polyol dispersions containing

(a) from 2 to 70 parts by weight tris(hydroxyalkyl)isocyanurate,

(b) from 98 to 30 parts by weight of at least one polyol having a functionality of from 2 to 8 and a hydroxyl number from 20 to 1800, and

(c) from 0 to 20 parts by weight of a dispersion stabilizer.

4,514,527

METHOD FOR OBTAINING STRONG ADHESIVE BONDING OF COMPOSITES TO DENTIN ENAMEL AND OTHER SUBSTRATES

Rafael L. Bowen, Gaithersberg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Filed Jan. 10, 1983, Ser. No. 457,029

Int. Cl.³ A10N *1/02;* **A65K** *5/00;* **C09K** *3/00*

U.S. Cl. 523—115 **38 Claims**

1. A method for preparing the surface of dentin or enamel for adhesion of composite materials or resins, which method comprises:

(a) contacting with the surface of the dentin or enamel an aqueous solution comprising at least one acidic salt containing a polyvalent cation which is capable of changing valence by unit steps and which can bind to dentin or enamel surface sites, and at least one anion which forms a relatively water-insoluble precipitate or precipitates with calcium and which contains at least one carboxyl group;

(b) contacting with the surface of the dentin or enamel a solution comprising at least one compound selected from the group consisting of (1) the adduct of N(p-tolyl)glycine and glycidyl methacrylate, and (2) the addition reaction product of N-phenylglycine and glycidyl methacrylate; and

(c) contacting with the surface of the dentin or enamel a solution comprising at least one compound selected from the group consisting of (1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, and (3) 4-methacryloxyethyltrimellitic anhydride.

8. A method as in claim 1 wherein the concentration of the solution comprising at least one compound selected from the group consisting of (1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, and (3) 4-methacryloxyethyltrimellitic anhydride is from about 0.1% to a saturated solution.

4,514,528

HYDROPHILIC DENTURE ADHESIVE

Dadi J. Dhabhar, Norwalk, and Nicholas F. Schmidt, Brookfield, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Feb. 16, 1983, Ser. No. 467,095

Int. Cl.³ A61K *5/06;* **C08L** *1/14*

U.S. Cl. 523—120 **52 Claims**

1. A denture adhesive composition comprising a substantially anhydrous mixture of:

(a) an effective adhesive amount of an adhesive fraction consisting essentially of a mixed, partial salt of AVE/MA copolymer in combination with either or both of sodium carboxymethylcellulose and poly(ethylene oxide) homopolymer; and

(b) a polyethylene glycol fraction comprising one or more polyethylene glycols each having an average molecular weight of from about 200 to about 20,000 and said fraction having an average viscosity of from about 44 to about 25,600 centipoises at about 60° C.

4,514,529

OIL RESISTANT LOW MODULUS SILICONE SEALANT COMPOSITION

Melvin D. Beers, Hudson, and James E. Thompson, Lakewood, both of Ohio, assignors to Loctite Corporation, Newington, Conn.

Filed Mar. 27, 1984, Ser. No. 593,866

Int. Cl.³ C08G *77/26;* **C08K** *9/04, 3/26;* **C08L** *83/08*

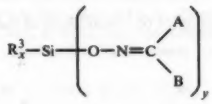
U.S. Cl. 523—200 **19 Claims**

1. A low modulus, one component, room temperature, vulcanizable silicone rubber composition consisting essentially of:

from about 25 to about 90 percent by weight based upon the total weight of the composition of a devolatilized silanol/-terminated diorganosiloxane base polymer having a viscosity from about 2,000 to about 250,000 centipoises at 25° C. where said organo groups can be the same or different and are selected from the groups consisting of alkyl having from 1 to 8 carbon atoms, a cycloalkyl having from 4 to 7 carbon atoms, an alkenyl having from 2 to 8 carbon atoms, an aryl or an alkyl substituted aryl having from 6 to 14 carbon atoms, or a fluoroalkyl having from 1 to 8 carbon atoms;

from about 0 to about 40 percent by weight based upon the total weight of said composition of a plasticizer comprising a devolatilized diorganopolysiloxane fluid plasticizer terminated with triorganosiloxy groups, said organo groups being a monovalent hydrocarbon radical as set forth above with regard to said base polymer, said plasticizer having a viscosity from about 50 to about 100,00 centipoises at 25° C.;

from about 2 to about 15 percent by weight based upon the total weight of said composition of an oxime crosslinking agent of the formula



where y is 2.2 to 3, x is 0.8 to 1.0, where R^3 is selected from the group consisting of an alkyl having from 1 to 8 carbon atoms, an alkenyl having from 2 to 8 carbon atoms, a haloalkyl having from 1 to 8 carbon atoms, and a haloalkenyl having from 2 to 8 carbon atoms, where A and B can be the same or different and wherein A and B are selected from the group consisting of a hydrogen, an alkyl having from 1 to 8 carbon atoms, a haloalkyl having from 1 to 8 carbon atoms, a cycloalkyl having from 4 to 7 carbon atoms, an alkenyl having from 2 to 8 carbon atoms, and a cycloalkenyl having from 4 to 7 carbon atoms;

from about 0.01 to about 0.5 percent by weight based upon the total weight of said composition of an organo tin catalyst and;

from about 5 to 60 percent by weight based upon the total weight of said composition of a hydrophobic calcium carbonate filler having 0.4 percent or less water content therein when the amount of said filler is 15 percent or less, or 0.2 percent or less water content when the amount of said filler ranges from about 15 to about 60 percent by weight.

2. A silicone rubber according to claim 1, wherein said hydrophobic filler is selected from the group consisting of treated ground calcium carbonate.

4,514,530
MODIFIED AMINE CURING AGENTS AND EPOXY RESINS CURED THEREWITH

Kathy B. Sellstrom, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,695
Int. Cl.³ C08L *63/04*
U.S. Cl. 523—456 **22 Claims**

1. A composition for use in the curing of a 1,2-epoxy resin comprising an alkylene carbonate solution of a normally solid cured elastomeric polyurethane in admixture with a primary amine curing agent.

4,514,531
MONOLITHIC REFRACTORIES COMPRISING A HYDROCOLLOID

Thomas R. Kleeb, and Linda L. Kleeb, both of Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 11, 1983, Ser. No. 540,241
Int. Cl.³ C04B *35/80, 35/78;* C08K *3/34, 7/26*
U.S. Cl. 524—5 **10 Claims**

1. Refractory monolithic batch consisting essentially of at least one refractory aggregate, a cementatious material and about 0.05 to 2.0% of a hydrocolloid based on the total weight of the batch, said hydrocolloid comprising an organic polymer capable of absorbing substantially at least 50 times its weight in water to form a substantially porous thermally insulating refractory product when the batch is dried.

4,514,532
MODIFIED PHENOL-FORMALDEHYDE RESIN AND THE PRODUCTION THEREOF

Oscar H. H. Hsu, and Milford C. Tassler, both of St. Charles, Ill., assignors to Masonite Corporation, Chicago, Ill.

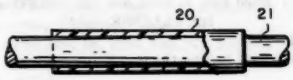
Continuation-in-part of Ser. No. 334,881, Dec. 28, 1981, Pat. No. 4,433,126. This application Feb. 17, 1984, Ser. No. 581,287
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ C08H *5/04;* C08G *83/00*
U.S. Cl. 524—14 **20 Claims**

1. A method of manufacturing a sheet material formed from a plurality of discrete members adhered together, including contacting a plurality of drscrete sheet material members with a binding resin; disposing each of said sheet material members in contact with at least one other of said sheet material members and pressing said sheet material members together with sufficient heat and pressure to form a sheet material, the improvement comprising said binding resin, wherein said resin is formed by reacting phenol and formaldehyde with a concentrated wood extract obtained by steam digesting wood chips under alkaline conditions, the weight of concentrated wood extract being from 5% to 50% of the weight of the phenol, calculated on the dry weight basis of each material.

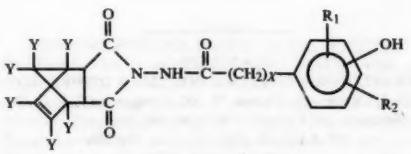
4,514,533
HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES AND STABILIZED COMPOSITIONS

Ralph H. Hansen, Lincoln, Mass., assignor to Canusa Coating Systems Limited, Rexdale, Canada

Filed Sep. 27, 1983, Ser. No. 536,182
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—89 **12 Claims**



1. The compound of the formula I



where X is 1, 2 or 3; Y is Cl or Br; R_1 is tert-butyl (t-butyl) and R_2 is H or lower alkyl of 1 to 4 carbons.

4,514,534
MODIFIED POLYPROPYLENE FOR FILM

Victor M. DiNardo, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 13, 1984, Ser. No. 599,880
Int. Cl.³ C08K *5/05, 5/15*
U.S. Cl. 524—108 **14 Claims**

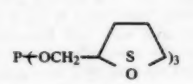
1. A modified polypropylene useful for making film comprising propylene homopolymer having a melt flow of about 2.0 to about 5.0 g/10 min.(L) said propylene homopolymer formed by cracking a lower melt flow polypropylene using a peroxide agent selected from the group consisting of dialkyl peroxides in an amount of about 50 pm to about 300 ppm, about 0.10% to about 0.25% bis(alkylbenzylidene) sorbitol nucleating agent wherein the alkyl groups have about 2–18 carbon atoms, and about 0.25% to about 2.0% linear low density polyethylene having a melting point of about 120° C. and comprising ethylene copolymerized with about 0.5% to about 7% olefin monomers having about 4 to about 8 carbon atoms.

4,514,535
ELECTRICAL TREE AND WATER TREE RESISTANT COMPOUNDS AND POLYMER COMPOSITIONS CONTAINING THE SAME

Harry Braus; Anthony Barlow, and Melvin F. Maringer, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,977
Int. Cl.³ C08K *5/52*
U.S. Cl. 524—109 **19 Claims**

1. A polymeric composition having enhanced resistance to water treeing and electrical treeing comprising an intimate admixture of a polymeric component and an effective water treeing and/or electrical treeing inhibitor amount of a compound having the structure:



said polymeric component being other than polyvinyl chloride.

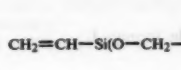
4,514,536

SILANES USEFUL AS ANTI-TREEING ADDITIVES

Harry Braus; Anthony Barlow, and Melvin F. Maringer, all of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,975
Int. Cl.³ C08K 5/54
U.S. Cl. 524—261 3 Claims

1. A compound having the structure



4,514,537

TETRAFLUOROETHYLENE POLYMER DISPERSIONS

Robert J. Cavanaugh, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 9, 1984, Ser. No. 578,656
Int. Cl.³ C08K 5/54
U.S. Cl. 524—265 7 Claims

1. A coating dispersion which imparts resistance to attack by acidic flue gas to glass fabric coated with said dispersion, consisting essentially of

(a) water,

(b) 2–65% by weight tetrafluoroethylene polymer, said weight based on weight of water and polymer, said polymer being of film-forming molecular weight,

(c) 2–60% by weight of a polyhydrolyzable silane of the formula

$$R_1Si—OR)_3$$

wherein R is lower alkyl, preferably alkyl of 1–3 carbon atoms, and R_1 is phenyl or substituted lower alkyl, preferably of 1–3 carbon atoms, in which the substituents are selected from halogen, quaternary ammonium, or —NR'R" in which R' and R" are each H, lower alkyl, lower alkoxyalkyl, amino lower alkyl, hydroxyl lower alkyl, or substituted amino lower alkyl, said weight based on weight of tetrafluoroethylene polymer,

(d) 1–20% by weight of a hydrocarbyl siloxane, said weight based on weight of tetrafluoroethylene polymer,

(e) 1–20% by weight of a polymer of a fluorinated ester of an acrylic acid, said weight based on weight of tetrafluoroethylene polymer, and

(f) 1–12% by weight of $C_9F_{17}O(CH_2CH_2O)_nR$ wherein n is an integer of 1 through 10 and R is hydrogen or alkyl of 1–10 carbon atoms, said weight based on weight of tetrafluoroethylene polymer.

4,514,538

COMPOSITION

Lidia Shvakhman, 236 Montrose Ave., Kenmore, N.Y. 14217; Ignatius T. Agro, 492 West Ave., Buffalo, N.Y. 14213, and Louis L. Chiusolo, 230 Glenwood Crescent, Oshawa, Ontario, Canada

Filed May 26, 1983, Ser. No. 498,482
Int. Cl.³ C08K 5/10; C08L 1/12, 33/12
U.S. Cl. 524—315 7 Claims

1. A self-sustaining waterproofing composition at least 75% of a substantially unswelled bentonite and the remainder a film forming composition, said film forming composition comprising an organic binder that is solid at room temperature and is substantially unreactive with said bentonite, said bentonite suspended substantially uniformly throughout said film forming composition to form thereby a substantially self-sustaining waterproofing element and wherein said film forming composition contains an alkylphthalate present in from about 0.1 to 5% of said total composition.

4,514,539

STAIN RESISTANT POLYMERIC INSULATING COMPOSITIONS

George A. Hattrich, and Stephen J. Byron, both of Hackettstown, N.J., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed May 5, 1983, Ser. No. 491,734
Int. Cl.³ C08K 3/10, 3/20, 3/34, 9/06
U.S. Cl. 524—436 14 Claims

1. A stain resistant flame retardant insulating composition comprising the following components:

Resin Component	Weight % (Based upon 100 parts of resin)
Ethylene-vinyl acetate copolymer	30–70
Polyethylene	30–70
Additives	**Parts/100 parts of resin**
Filler selected from the group consisting of aluminum trihydrate, hydrated magnesia, and hydrated calcium silicate	80–150
Tetrakis methane	0.5–4
Thiodiethylene hydrocinnamate	0.25–3
Distearothiodipropionate	0.5–4
Vinyl silane	0.5–5
Peroxide selected from the group consisting of butylperoxydiisopropylenebenzene, dicumyl peroxide, t-butylcumyl peroxide, and mixtures thereof.	1–10

4,514,540

WATER REDUCIBLE POLYAMIDES

Michael C. Peck, Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Sep. 26, 1983, Ser. No. 535,635
Int. Cl.³ C09D 3/70, 11/10
U.S. Cl. 524—514 5 Claims

1. The copolymer reaction product of:

(A) 20 to 60 equivalent percent of a polymeric fatty acid;

(B) 0 to 60 equivalent percent of a polycarboxylic acid selection from the group consisting of a tricarboxylic acid and a dicarboxylic acid;

(C) 15 to 50 equivalent percent of a monocarboxylic acid; and

(D) 5 to 25 equivalent percent of a synthetic polymeric resin having a crystalline chain structure, said resin having active carboxyl and/or hydroxyl groups capable of reaction with acid/amine groups; with

(E) 50 to 80 equivalent percent of an organic polyamine.

4,514,541

FIBER CONTAINING PARTICULATE ELASTOMERIC COMPOSITION

Arnold Frances, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1984, Ser. No. 612,751
Int. Cl.³ C08K 3/36, 3/04
U.S. Cl. 524—514 16 Claims

1. Process for preparing a particulate elastomeric composition having a density ratio of 0.1 to 0.4 exclusive of any organic solvent which may be present whereby 10 to 60 parts of aramid pulp and 15 to 65 parts of reinforcing filler are thoroughly mixed, a solution of elastomer in an organic solvent is added with continued stirring, the quantity of solution being sufficient to provide 5 to 75 parts elastomer, all parts to add up to

100 parts exclusive of organic solvent, the elastomeric particles are removed.

4,514,542

AROMATIC HYDROCARBON RESINS CONTAINING VINYLKETONE GROUPS AND POLYMERS THEREOF

Hacene Mehalla, Strasbourg, France, assignor to Societe Chimique des Carbonnages S.A., Paris La Defense, France

Division of Ser. No. 382,315, May 26, 1982, Pat. No. 4,465,811. This application Jun. 6, 1984, Ser. No. 617,870

Claims priority, application France, May 26, 1981, 81 10433

Int. Cl.³ C08L *25/16, 25/04;* **C08F** *293/00, 299/00*

U.S. Cl. 525—193 **10 Claims**

1. A copolymer of an acylated aromatic resin and a living polymer, said acrylated aromatic resin consisting essentially of a polymerizate of a mixture of hydrocarbons comprising 1 to 30 mol % styrene, 9 to 60 mol % vinyl toluene, and 10 to 90 mol % indenes, said polymerizate having a number-average molecular weight of about 500–2,500 and having grafted to the aromatic nuclei thereof vinylketone groups in a proportion of about 0.02 to 0.07 vinylketone groups per aromatic nucleus; said vinylketone groups being of the formula:

$$RR'C{=}CR''{-}CO{-}$$

wherein R, R' and R'' being identical or different represent hydrogen, methyl, ethyl, n-propyl, isopropyl or halogen.

4,514,543

METHYLMETHACRYLATE/PHENYLMALEIMIDE COPOLYMER AND STYRENE/MALEIC ANHYDRIDE COPOLYMER

Barry D. Dean, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 3, 1983, Ser. No. 538,243

Int. Cl.³ C08L *35/02, 35/04, 39/04*

U.S. Cl. 525—205 **13 Claims**

1. A polymer alloy comprising a first and a second polymer wherein,

(a) the first polymer is a random copolymer consisting essentially of recurring units of methylmethacrylate and recurring units of N-phenylmaleimide; and

(b) the second polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and from about 9.5 to about 12.5 weight percent recurring units of maleic anhydride and a random terpolymer of recurring units of styrene, from about 6 to about 9 weight percent recurring units of maleic anhydride and from about 3 to about 8 weight percent recurring units of N-phenylmaleimide.

4,514,544

PAPER SIZING AGENT COMPRISED OF REACTION PRODUCT OF MALEIC ANHYDRIDE AND PROPYLENE OLIGOMERS

Yoshio Takahashi, and Takeshi Shoji, both of Kanagawa, Japan, assignors to Mitsubishi Oil Company, Limited, Japan

Filed Dec. 5, 1983, Ser. No. 558,238

Int. Cl.³ C08F *222/04, 8/12*

U.S. Cl. 525—327.4 **12 Claims**

1. A paper sizing agent, produced by the process comprising the steps of:

reacting a propylene oligomer having an average molecular weight in the range of 175 to 250 with maleic anhydride under heating in the absence of catalyst, the propylene oligomer is comprised such that it does not substantially contain oligomers having 10 or less carbon atoms and wherein the content of oligomers having 11 to 12 carbon atoms is 0 to 30% by volume, the content of oligomers having 13 to 15 carbon atoms is 20 to 95% by volume and the content of oligomers having 16 to 21 carbon atoms is 5 to 50% by volume;

allowing the reaction to proceed in order to obtain a reaction product; and

subjecting the reaction product to alkali saponification.

4,514,545

WATER CURABLE, AZIDE SULFONYL SILANE MODIFIED, ALKYLENE-ALKYL ACRYLATE COPOLYMERS

Austin E. Barnabeo, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 18, 1984, Ser. No. 570,785

Int. Cl.³ C08F *8/34, 8/00*

U.S. Cl. 525—330.4 **17 Claims**

1. A water curable polymer of a hydrolyzable azide sulfonyl silane and an alkylene-alkyl acrylate copolymer having about one to about 50 percent by weight combined alkyl acrylate.

4,514,546

COATING POWDER BASED ON SAPONIFIED ETHYLENE/VINYL ACETATE COPOLYMERS AND THE USE THEREOF

Raoul Resz, Bergisch Gladbach; Heinrich Alberts, Odenthal-Blecher; Hans-Heribert Burgdörfer, Cologne, and Aziz El Sayed, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,607

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305353

Int. Cl.³ C08L *29/04*

U.S. Cl. 525—57 **3 Claims**

1. A powder coating composition which consists essentially of:

(1) from 99.95 to 80% by weight of one or more saponified ethylene/vinyl acetate copolymers and

(2) from 20 to 0.05%, by weight, of one or more (meth) acrylic acid C_1–C_{24} alkyl ester homo-or co-polymers.

4,514,547

2-HYDROXYPROPANE SULPHONIC ACID DERIVATIVES: THEIR PREPARATION AND CURABLE COMPOSITIONS THEREOF

Arend Noordam, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

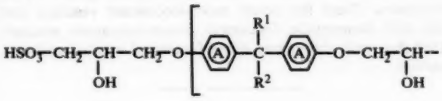
Filed Apr. 28, 1983, Ser. No. 489,435

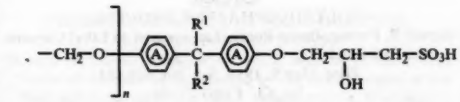
Claims priority, application United Kingdom, Jul. 6, 1982, 8219521

Int. Cl.³ C08L *63/02*

U.S. Cl. 525—510 **9 Claims**

1. A 2-hydroxypropane sulphonic acid derivative of general formula





wherein n is a number having an average value from 0 to 12, Ⓐ denotes saturation of aromatic unsaturation in an associated carbocyclic ring, and each of the R^1 and R^2 groups are independently selected from hydrogen and $C_{1\text{-}12}$ alkyl groups provided that each $—C(R^1)(R^2)$-group contains not more than 13 carbon atoms; or a salt thereof.

4,514,548

CROSSLINKABLE COMPOSITION OF MATTER-I

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,678

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.³ C08F *283/00*; C08L *63/00*

U.S. Cl. 525—528 **28 Claims**

1. A crosslinkable composition of matter, which composition comprises:

A. substantially gel-free conjugated diene-functionalized epoxy-amine adduct, comprising the reaction product of (i) first polyhydroxy functional epoxy-amine reactant comprising the reaction product of polyepoxy reactant having an average of at least about 2 epoxy groups per molecule with secondary amine reactant having a total of less than about 20 carbons per amino nitrogen, wherein each hydroxy group, if any, of the secondary amine is removed at least 1 carbon from each amino nitrogen, with (ii) conjugated diene functional mono-isocyanate reactant; and

B. substantially gel-free dieneophile-functionalized epoxy-amine adduct, other than said conjugated diene functionalized epoxy-amine adduct, comprising the reaction product of (i) second polyhydroxy functional epoxy-amine reactant comprising the reaction product of polyepoxy reactant having an average of at least about 2 epoxy groups per molecule with secondary amine reactant having a total of less than about 20 carbons per amino nitrogen, wherein each hydroxy group, if any, of the secondary amine is removed at least 1 carbon from each amino nitrogen, with (ii) dieneophile functional mono-isocyanate reactant.

4,514,549

CROSSLINKABLE COMPOSITION OF MATTER-IV

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,718

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.³ C08F *283/00*; C08G *59/14*

U.S. Cl. 525—528 **28 Claims**

1. A self-crosslinkable substantially gel-free conjugated diene-functionalized dieneophile-functionalized epoxy-amine adduct, preferably of number average molecular weight about 500–8000, comprising the reaction product of (i) polyhydroxy functional epoxy-amine reactant comprising the reaction product of polyepoxy reactant having an average of at least about 2 epoxy groups per molecule with secondary amine reactant having a total of less than about 20 carbons per amino nitrogen, wherein each hydroxy group, if any, of the secondary amine is removed at least 1 carbon from each amino nitrogen, with (ii) conjugated diene functional mono-isocyanate reactant and with (iii) dieneophile functional mono-isocyanate reactant other than said conjugated diene functional mono-isocyanate reactant.

4,514,550

POLYPHOSPHAZENE PROCESS

Harold R. Penton, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 9, 1984, Ser. No. 608,653

Int. Cl.³ C08G *79/04*

U.S. Cl. 525—538 **24 Claims**

1. A process for replacing the chloride substituents on a phosphonitrilic chloride polymer with an aryloxide or alkoxide group in a single liquid reaction medium, said process comprising heating a mixture of said phosphonitrilic chloride polymer and at least 0.9 moles per equivalent of replaceable chloride in said phosphonitrilic chloride, of an alkali metal aryloxide, alkoxide or mixture thereof in a liquid hydrocarbon reaction medium in which said alkali metal aryloxide and alkoxide are substantially insoluble and in which the resultant substituted polymer is soluble, said heating being at a temperature of about 120°–200° C. for a period of time sufficient to obtain a substantial amount of substituted polymer.

4,514,551

PROCESS FOR THE PREPARATION OF CATIONIC POLYMERS

Akihisa Furuno, Yokohama; Kenichi Inukai, Ohtake, and Yasuo Ogawa, Kawasaki, all of Japan, assignors to Nitto Chemical Industry Co., Ltd.; Mitsubishi Rayon Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan

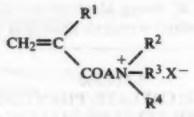
Filed Jan. 23, 1984, Ser. No. 572,753

Claims priority, application Japan, Jan. 24, 1983, 58-8799

Int. Cl.³ C08F *2/38*

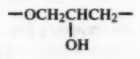
U.S. Cl. 526—233 **10 Claims**

1. In a process for producing a cationic polymer by polymerizing a monomer mixture containing acrylamide and a cationic alkenyl monomer represented by the general formula (I):



(I)

wherein R^1 represents H or CH_3; R^2 and R^3 represent independently CH_3 or C_2H_5; R^4 represents H, CH_3, C_2H_5 or benzyl, A represents $—OC_nH_{2n}—$ (n being 2 or 3),



or $—NC_nH_{2n}—$ (n being 2 or 3), and x— represents Cl^-, Br^-, I^-, $CH_3SO_4^-$, $C_2H_5SO_4^-$, $\frac{1}{2}SO_4^{--}$ or $CH_3COO—$ in the form of a sheet in an aqueous medium, wherein the weight ratio of acrylamide/cationic alkenyl monomer is within the range of 95/5 to 5/95,

the improvement wherein polymerization is conducted in the presence of from 1 to 10,000 ppm based on the monomer of a water-soluble phosphite as a chain transfer agent.

4,514,552

ALKALI SOLUBLE LATEX THICKENERS

Gregory D. Shay, Oak Forest; Emmojean Eldridge, Chicago, and James E. Kail, Arlington Heights, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 23, 1984, Ser. No. 643,370

Int. Cl.³ C08F *220/34*

U.S. Cl. 526—301 **13 Claims**

1. An alkali soluble thickener which is an aqueous emulsion copolymer of:

(A) about 20–70 weight percent of an alpha, beta-monoethylenically unsaturated carboxylic acid,

(B) about 20–80 weight percent of a monoethylenically unsaturated monomer lacking surfactant capacity;

(C) about 0.5–60 weight percent of a non-ionic urethane monomer which is the urethane reaction product of a nonohydric nonionic surfactant with a monoethylenically unsaturated monoisocyanate; and

(D) from 0 up to about 2 weight percent of a polyethylenically unsaturated monomer.

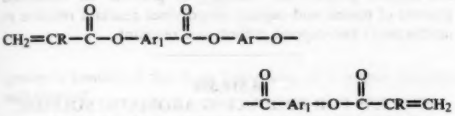
4,514,553

THERMOSET RESIN PRODUCED FROM ANISOTROPIC HEAT-CURABLE ACRYLIC-TERMINATED MONOMERS

Anthony B. Conciatori, Chatham; Eui W. Choe, Randolph, and Gerald Farrow, New Providence, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 381,598, May 24, 1982, Pat. No. 4,452,993.
This application Feb. 3, 1984, Ser. No. 576,554
Int. Cl.[3] C08F *20/30*
U.S. Cl. 526—323.1 16 Claims

1. A thermoset resin comprised of heat-cured segments derived from acrylic-terminated monomers capable of forming an anisotropic melt phase of the formula:



wherein Ar is a divalent radical comprising at least one aromatic ring, Ar_1 is a divalent radical selected from the group consisting of phenylene, naphthylene, biphenylene and mixtures thereof and R is selected from the group consisting of hydrogen and methyl, with at least some of the hydrogen atoms present upon the aromatic rings in said divalent radicals optionally being replaced by substitution selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, halogen, phenyl, substituted phenyl and mixtures thereof.

4,514,554

PETROLEUM RESIN AND PRESSURE SENSITIVE ADHESIVE FORMULATIONS UTILIZING SAME AS TACKIFIER

Vincent L. Hughes, and Francisco M. Benitez, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 23, 1983, Ser. No. 469,097
Int. Cl.[3] C08F *210/14*
U.S. Cl. 526—339 8 Claims

1. A petroleum resin containing a major proportion of the aluminum halide catalyzed polymer of the combination of pentadiene 1,3 and 2-methyl butenes, a number average molecular weight ($\overline{M}n$) of from 500 to 600, a weight average molecular weight ($\overline{M}w$) of from 800 to 960, a $\overline{M}w/\overline{M}n$ ratio of 1.3 to 1.9 and a softening point ranging from 78° C. to 81° C.

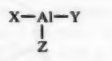
4,514,555

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT ORGANOALUMINUM POLYMERS

Isoji Taniguchi, Kyoto, and Yoshiharu Kimura, Ohmihachiman, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,074
Claims priority, application Japan, Apr. 16, 1983, 58-67564; Sep. 2, 1983, 58-162321; Nov. 2, 1983, 58-206815
Int. Cl.[3] C08G *79/10*
U.S. Cl. 528—9 13 Claims

1. A process for producing a high molecular weight organoaluminum polymer comprising reacting an organoaluminum compound with water, the improvement wherein the reactants are (1) water, (2) an organoaluminum compound represented by the general formula (I):



(I)

wherein X, Y and Z are each a hydrogen atom, an alkyl group, an alkoxyl group, or an acyloxyl group, provided that when any one of X, Y and Z is an acyloxyl group, at least one of the others is an acyloxyl group and (3) an organic acid in an amount such that the total amount of the organic acid and the acyloxyl group contained in the organoaluminum compound is from 1.1 to 11 moles per mole of the organoaluminum compound.

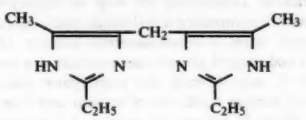
4,514,556

4,4'-METHYLENE-BIS-(2-ETHYL-5-METHYL IMIDAZOLE) AND METHODS OF PRODUCING AND USING THE SAME

Natsuo Sawa, Kagawa; Toshihiro Suzuki, Saitama, and Shinji Okazaki, Kagawa, all of Japan, assignors to Shikoku Chemicals Corporation, Japan

Filed Mar. 29, 1984, Ser. No. 594,902
Claims priority, application Japan, Apr. 14, 1983, 58-66584
Int. Cl.[3] C08G *59/50, 59/68;* C07D *233/88*
U.S. Cl. 528—117 13 Claims

1. 4,4'-methylene-bis-(2-ethyl-5-methyl imidazole) represented by the structural formula



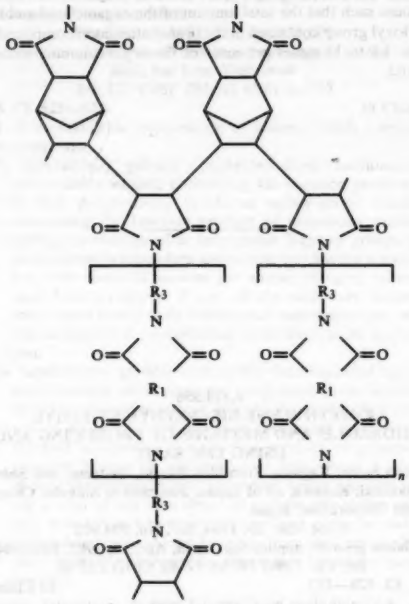
4,514,557

CHEMICAL CONTROL OF NADIMIDE CURE TEMPERATURE AND RATE

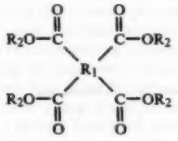
Richard W. Lauver, Rocky River, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 404,809, Aug. 3, 1982, Pat. No. 4,455,418.
This application Jul. 22, 1983, Ser. No. 516,217
Int. Cl.[3] C08G *73/10*
U.S. Cl. 528—342 6 Claims

1. A process for the production of a polyimide of the general formula:



wherein R_1 is a tetravalent aromatic radical and R_3 is a divalent aromatic radical, comprising the step of: copolymerizing a reaction mixture comprising a maleimido end capped prepolymer reactant with a stoichiometric amount of norbornenylimido end-capped prepolymer reactant at a temperature below 300° C. and wherein the prepolymer reactancts are generated by heating a solution of solvent and from about 30 percent to about 70 percent by weight of a mixture of compounds of the formulae:

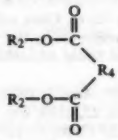


(a)

wherein R_1 is a tetravalent aromatic radical and at least two of R_2 are alkyl with the remainder being hydrogen: and ps

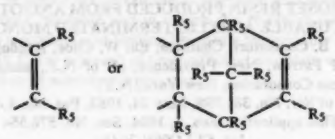
(b) $H_2N—R_3—NH_2$

wherein R_3 is a divalent aromatic radical: and



(c)

wherein R_2 is defined as in (a) and at least one R_2 in (c) being alkyl, and R_4 is



wherein R_5 is hydrogen or lower alkyl of 1–4 carbons and wherein the ratio of (a):(b):(c) is n:(n+1):2, wherein n has a value from 1–20, to obtain curable polyimide prepolymers and including the step of adding an effective amount of maleic end-capped prepolymer reactant to provide an enhanced amount of maleic end-capped prepolymer reactant relative to norbornenyl end-capped prepolymer reactant.

4,514,558

PROCESS FOR PRODUCING AROMATIC SULFIDE POLYMER WITH ANHYDROUS AMORPHOUS VITREOUS COMPLEX DEHALOGENATION AGENT

Zenya Shiiki; Yo Iizuka, and Yukichika Kawakami, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,988
Claims priority, application Japan, Dec. 14, 1982, 57-218784
Int. Cl.³ C08G *75/16*
U.S. Cl. 528—388 **9 Claims**

1. A process for producing a high molecular weight aromatic sulfide polymer which comprises heating, to a temperature of 100° to 270° C. in a composition comprising (1) an organic solvent, (2) a very small amount of water, (3) a dihaloaromatic compound and (4) a substantially anhydrous amorphous vitreous compound that is a solid ionic complex produced by the contact of (i) (a) S^{2-} and (b) inorganic salt-forming anions other than the S^{2-} and (ii) ions of a metal selected from an alkali metal or an alkaline earth metal in an aqueous solution followed by drying, the amount of the dihaloaromatic compound being 0.8 to 1.1 g equivalent with respect to the amount of the amorphous vitreous compound containing 1 g equivalant of S^{2-}.

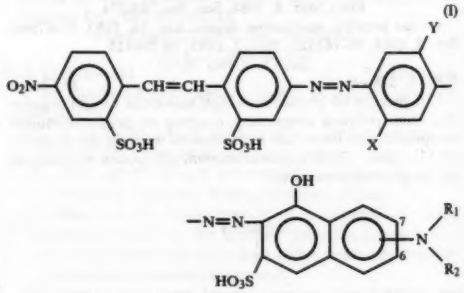
4,514,559

WATER SOLUBLE DISAZO COMPOUND, COPPER SALT THEREOF, AND SHEET OR FILM COLORED THEREWITH

Giichi Sato, Tokyo; Tadashi Matuo, Koonosu, and Tooru Tabei, Kitamoto, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

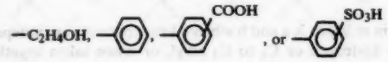
Filed Apr. 27, 1984, Ser. No. 604,475
Int. Cl.³ C09B *45/24*
U.S. Cl. 534—690 **11 Claims**

1. A water soluble disazo compound represented, in the free acid form, by the formula:



(I)

wherein X represents a hydrogen atom or a methyl, methoxy or ethoxy group; Y represents a methoxy or ethoxy group; R_1 represents a hydrogen atom or a methyl group; R_2 represents a hydrogen atom or a methyl,



group, and the

group is bonded at the 6- or 7-position, or a copper complex salt thereof.

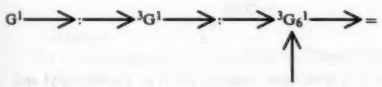
4,514,560

AGGREGATING POLYSACCHARIDE DERIVED FROM AUREOBACIDIUM

Satoru Shinohara, No. 8-14, Takasago-cho, Hyuga-shi, Miyazaki-ken; Noboru Fujii, No. 37 Haramachi 1-chome; Kiyohisa Imada, No. 41-5, Otsukadainishi 3-chome, both of Miyazaki-shi, Miyazaki-ken; Genichi Kadota, No. 6276-83, Tomitaka, Hyuga-shi, Miyazaki-ken, and Hideo Ueno, No. 608, Zaikoji, Hyuga-shi, Miyazaki-ken, all of Japan

Filed Mar. 2, 1982, Ser. No. 353,968
Claims priority, application Japan, Mar. 11, 1981, 56-35001
Int. Cl.³ C12P *19/04*
U.S. Cl. 536—1.1 **7 Claims**

1. A polysaccharide having D-glucose as main constitutive sugar therein as detected by gas chromatography carried out through methylation and hydrolysis and by paper chromatography carried out through acid hydrolysis in accordance with the Hakomori's method; showing



0.38 to 0.43:0.14 to 0.24:0.38 to 0.43

in gas chromatographic mass spectrometry (GC-MS method); having the absorption position of C_1 at 103 ppm as measured from a ^{13}C-nuclear magnetic resonance spectrum; showing characteristic absorption at 1720 cm^{-1}–1760 cm^{-1} and 890 cm^{-1} in an infrared absorption spectrum; having number average molecular weight between 50,000 and 500,000 as measured by the osmotic method; having a specific rotation $[\alpha]_D^{25}$ between +20 and +70; consisting 42.0 to 45.0% of carbon, 5.7 to 6.7% of hydrogen, 0 to 1.0% of nitrogen, 0.2 to 0.8% of ash content and the rest of oxygen according to the results of an elementary analysis; containing 4.0 to 6.0% of phosphoric acid in total therein as measured by a fluorescent X-ray analysis, the Allen's improved method and the Deniges-Atkins method after carbonic acid melting showing a color reaction of saccharides in an α-naphthol-sulfuric acid reaction, an indole-sulfuric acid reaction and a phenol-sulfuric acid reaction; being negative in a ninhydrin reaction, a carbazole-sulfuric acid reaction and an Elson-Morgan's reaction; being soluble in dimethyl sulfoxide (DMSO); swelling well in water though not readily soluble therein; and being insoluble in ethanol, pyridine, chloroform and other organic solvents.

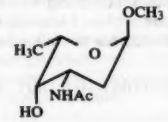
4,514,561

PROCESS FOR PREPARING α-L N-ACETYL DAUNOSAMINIDE

Bertram Fraser-Reid, Silver Spring, Md., and Heinz W. Pauls, Durham, N.C., assignors to Research Corporation, New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,192
Int. Cl.³ C07H *1/00*
U.S. Cl. 536—18.7 **1 Claim**

1. A method for the synthesis of methyl alpha-L N-acetyl daunosaminide of the formula:



which comprises the steps of:

(a) reacting methyl 2,3-dideoxy-alpha-L-erythrohex-2-enopyranoside with benzoic acid to invert the allylic hydroxy group;

(b) treating the resulting product to obtain the free hydroxyl group from the inverted benzoate ester;

(c) converting the free allylic hydroxy group to the corresponding imidate ester;

(d) cyclizing the resulting imidate ester;

(e) subjecting the cyclized imidate ester to hydrogenolysis to replace the halogen atoms with hydrogen atoms; and

(f) thereafter hydrolyzing the resulting dehalogenated cyclized imidate ester to give methyl alpha-L N-acetyl daunosaminide.

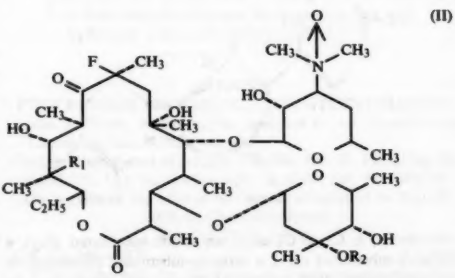
4,514,562

FLUORINATED ERYTHROMYCIN COMPOUNDS AND A PROCESS FOR PREPARATION

Luciano Toscano, Milan, Italy, assignor to Pierrel Spa, Napoli, Italy

Filed Nov. 22, 1982, Ser. No. 443,580
Claims priority, application Italy, Nov. 27, 1981, 25345 A/81
Int. Cl.³ C07H *17/04*
U.S. Cl. 536—7.2 **24 Claims**

19. (8S)-8-fluoroerythromycin N-oxides having the formula:



wherein R_1 is hydrogen or OH, and R_2 is hydrogen or methyl.

4,514,563

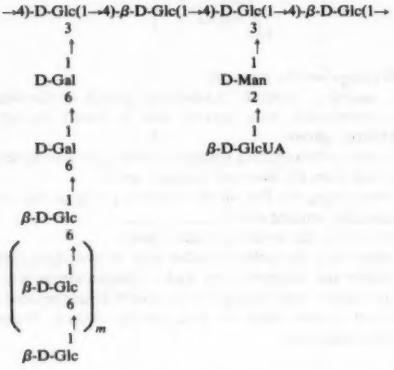
HIGHLY VISCOUS POLYSACCHARIDES

Seiichi Fujiyama; Hiroyuki Minakami, both of Aichi, and Hiroshi Masai, Hanada, all of Japan, assignors to Nakano Vinegar Co., Ltd., Handa, Japan

Continuation-in-part of Ser. No. 436,398, Oct. 25, 1982, abandoned. This application Mar. 29, 1983, Ser. No. 479,919
Claims priority, application Japan, Nov. 5, 1981, 56-176510
Int. Cl.[3] C08B *37/00*; C12P *19/06*
U.S. Cl. 536—123 **3 Claims**

1. Highly viscous polysaccharides composed mainly of (a) glucose, (b) galactose, (c) mannose, and (d) glucuronic acid, the molar ratio of (a):(b):(c):(d) being 10:3–6:0.5–2:0.5–2.

3. The polysaccharide of claim 1 wherein the main repeating units of the polysaccharide has the following structure



wherein m is 0 or 1, Glc is glucose, Gal is galactose, Man is mannose, and GlcUA is glucuronic acid.

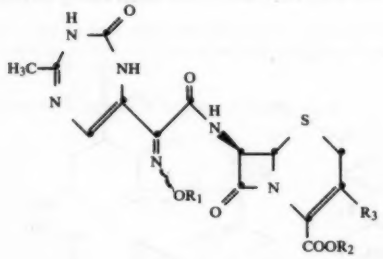
4,514,564

7β-(2′-(1″,3″,5″-TRIAZEPIN-4″-ONE)-2′-(OXIME ETHER)-ACETAMIDO)-3-SUBSTITUTED CEPHALOSPORINS

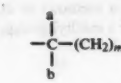
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 18, 1983, Ser. No. 486,132
Int. Cl.[3] C07D *501/38, 501/36*; A61K *31/545*
U.S. Cl. 544—25 **11 Claims**

1. A compound of the formula



wherein R_1 is C_1 to C_4 alkyl, an amido-substituted alkyl, a carboxy-substituted alkyl, a carboxy-substituted cycloalkyl or an amido-substituted cycloalkyl group represented by the formula

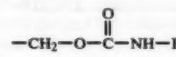


wherein m is 0 to 3, a and b when taken separately are independently hydrogen or C_1 to C_3 alkyl, or when taken together with the carbon to which they are attached form a C_3 to C_7 carbocyclic ring; R′ is hydroxy, amino, C_1 to C_4 alkoxy, or —OR″, where R″ is a carboxy protecting group; R_2 is hydrogen, a carboxy protecting group or a pharmaceutically acceptable, non-toxic salt thereof, the hydrates of said salt, or the non-toxic metabolically labile esters thereof, provided that when R_3 is hydroxy, R_2 is other than hydrogen; R_3 is

(a) hydrogen, fluoro, bromo, chloro, hydroxy, methyl, methoxy or hydroxymethyl; or

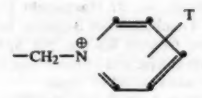
(b) (C_2 to C_4 acyloxy)methyl; or

(c) a methyl carbamate group of the formula



wherein R‴ is hydrogen or C_1 to C_4 alkyl;

(d) a pyridinium methyl group of the formula



wherein T is

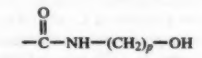
(i) hydrogen, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, hydroxy, cyano, halo or hydroxymethyl; or

(ii) carboxy, C_1–C_4 alkoxycarbonyl, C_1 to C_4 alkanoyl or C_1 to C_4 alkanoyloxy; or

(iii) an amido group of the formula

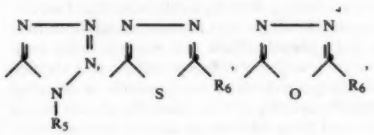
wherein c is hydrogen, methyl, ethyl or cyclopropyl and d is hydrogen, methyl or ethyl; or

(iv) a group of the formula

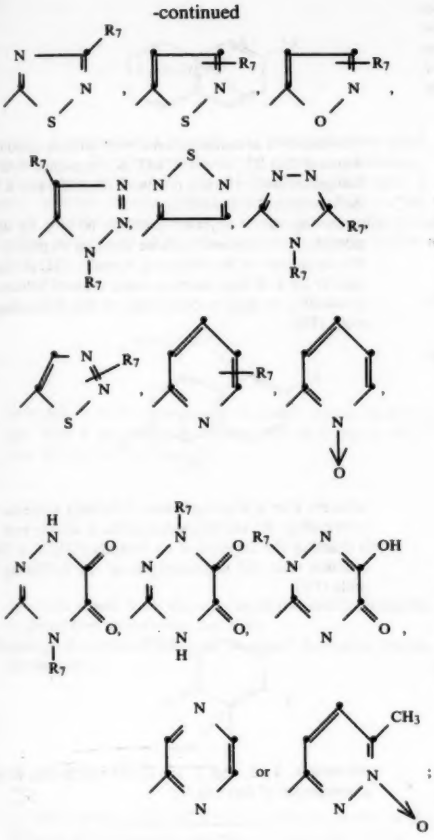


wherein p is 1 to 4; provided that (a) when the pyridinium ring is substituted with the above substituents in (iv), the pyridinium ring is additionally substituted with R_4, wherein R_4 is hydrogen or C_1 to C_4 alkyl; and (b) when T is hydroxy or halo, T is only bonded to the 3 position of the pyridinium ring; or

(e) a heterocyclic thiomethyl group of the formula —CH$_2$—S—Y, wherein Y is



-continued



wherein

R_5 is hydrogen, C_1 to C_4 alkyl, $—CH_2COOH$ or $—CH_2SO_3H$;

R_6 is hydrogen, C_1 to C_4 alkyl, phenyl or amino; and

R_7 is hydrogen or C_1 to C_4 alkyl.

4,514,565

THIAZOLYLACETAMIDO CEPHALOSPHORIN COMPOUNDS

Michihiko Ochiai, Osaka; Taiiti Okada, Kyoto; Osami Aki, Kawanishi; Akira Morimoto; Kenji Kawakita, both of Osaka, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

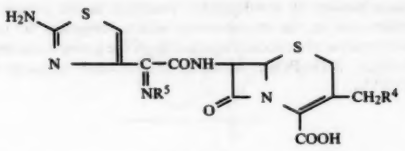
Continuation of Ser. No. 191,934, Sep. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 71,032, Aug. 28, 1979, Pat. No. 4,298,606, which is a division of Ser. No. 900,233, Apr. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 642,356, Dec. 19, 1975, Pat. No. 4,098,888. This application Jun. 24, 1983, Ser. No. 525,663

Claims priority, application Japan, Dec. 19, 1974, 49-146567; United Kingdom, Jun. 9, 1975, 24611/75

Int. Cl.³ C07D *501/38;* A61K *31/545*

U.S. Cl. 544—25 **2 Claims**

1. A compound of the formula



wherein

R^4 is pyridinium, 3-methylpyridinium, 4-methylpyridinium, 3-chloropyridinium, 3-bromopyridinium, 3-iodopyridinium, 4-carbamoylpyridinium, 4-(N-hydroxymethylcarbamoyl)pyridinium, 4-(N-carbomethoxycarbamoyl)pyridinium, 4-(N-cyanocarbamoyl)pyridinium, 4-(carboxymethyl)pyridinium, 4-(hydroxymethyl)-pyridinium, 4-(trifluoromethyl)pyridinium, quinolinium, picolinium or lutidium; and

R^5 is hydroxy or protected hydroxy or a pharmaceutically acceptable salt or 4-carboxy ester which is the alkoxymethyl, alpha-alkoxyethyl, alpha-alkoxy-alpha-substituted methyl, alkylthiomethyl, acyloxymethyl or alpha-acryloxy-alpha-substituted methyl ester thereof.

4,514,566

5-OXO-3-THIAZOLINE OXIME AND 2-OXO-5,6-DIHYDRO-2H-1,4-THIAZINE OXIME DERIVATIVES

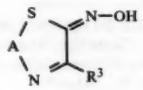
Christoph Lüthy, Schwerzenbach, and Paul Winternitz, Greifensee, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 257,072, Apr. 24, 1981, Pat. No. 4,427,687. This application Oct. 27, 1983, Ser. No. 546,212

Int. Cl.³ C07D *277/04*

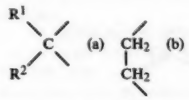
U.S. Cl. 544—56 **6 Claims**

1. A compound of the formula



II

wherein A is a group (a) or (b)



R^1 and R^2 are hydrogen, lower alkyl or cycloalkyl, or together with the carbon atom to which they are attached a 4- to 6-membered, saturated hydrocarbon ring and

R^3 is hydrogen, lower alkyl or cycloalkyl.

4,514,567

PROCESS FOR PREPARING TRIETHYLENEDIAMINE

James E. Wells, Ardmore, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 278,814, Jun. 29, 1981, Pat. No. 4,405,784. This application Apr. 22, 1983, Ser. No. 487,789

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ C07C *295/02*

U.S. Cl. 544—352 **4 Claims**

1. In a method for synthesis of triethylenediamine from nitrogen-containing compounds selected from the group consisting of hydroxyethylpiperazine, crude hydroxyethylpipera-

zine, N-aminoethyl piperazine, ethanolamines and substituted ethanolamines by condensation reactions in the presence of acidic catalyst, the improvement which comprises the use as such catalyst of a product selected from the group consisting of $Sr_2P_2O_7$, $Sr(H_2PO_4)_2$, mixtures thereof, and mixtures with $SrHPO_4$.

4,514,568

5-(4-NITROPHENYL)-2(1H)-PYRAZINONES

William J. Coates, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

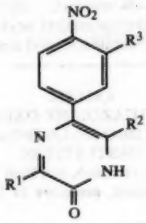
Filed Jun. 2, 1983, Ser. No. 500,484

Claims priority, application United Kingdom, Jun. 5, 1982, 8216437; Jan. 8, 1983, 8300476

Int. Cl.³ C07D *241/18*

U.S. Cl. 544—408 **2 Claims**

1. A compound of the formula (I):



(I)

wherein R^1, R^2 and R^3 are independently hydrogen or C_{1-4} alkyl.

4,514,569

SYNTHESIS OF 1-SUBSTITUTED ISOQUINOLINES

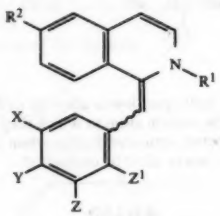
James B. Hendrickson, 9 Acacia St., Cambridge, Mass. 02138, and César Rodriguez, 567 South St., Waltham, Mass. 02154

Filed Jan. 28, 1982, Ser. No. 343,407

Int. Cl.³ C07D *217/20*

U.S. Cl. 546—146 **16 Claims**

1. A method of preparing a morphine intermediate of the following formula (I):



(I)

wherein

R^1 is COR group wherein R is C_{1-6} alkyl, phenyl, or C_{1-6} alkoxy;

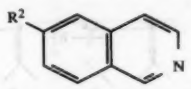
R^2 is hydrogen or C_{1-6} alkoxy;

X and Z, which may be the same or different, are hydrogen, hydroxy, silyloxy, halogen, lower alkoxy, phenoxy, lower alkyl, trimethylsiloxy, phenyl, or benzyloxy;

Y is hydroxy, silyloxy, halogen, lower alkoxy, phenoxy, phenyl, or lower alkyl;

Z^1 hydrogen or halogen, comprising the following steps

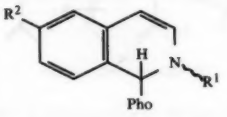
(i) reacting an isoquinoline of the following formula (II):



(II)

wherein R^2 is as defined above, with a compound of the formula LG-R^1, wherein LG is mercapto, hydroxy, halogeno, lower alkoxy, or lower alkylthio and R^1 is as defined above, followed by

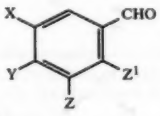
(ii) reacting the N-acylated produce of step (i) with a phosphorus compound capable of being displaced from the compound of the following formula (III) as the Pho moiety by a Wittig reaction using n-butyl lithium and isovanillin, to yield a compound of the following formula (III):



(III)

wherein Pho is a phosphonate $PO(OR)_2$ wherein R is lower alkyl. R^1 and R^2, are as defined above; and

(iii) reacting the compound of formula (III) in a Wittig reaction with the benzaldehyde of the following formula (IV):



(IV)

wherein X, Y, Z, and Z^1 are as defined above, to yield a compound of formula (I).

4,514,570

PROCESS FOR THE PREPARATION OF 2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINE COMPOUNDS

Joseph S. Bowers, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,647

Int. Cl.³ C07D *215/06, 215/14*

U.S. Cl. 546—181 **3 Claims**

1. In a process of producing 2,2,4-trimethyl-1,2-dihydroquinoline compounds by reacting an aniline compound with acetone in the presence of a catalyst, the improvement which comprises carrying out said reaction in the presence of a strongly acidic sulfonic acid-type macroreticular cation exchange resin as the catalyst.

4,514,571

PROCESS FOR THE PREPARATION OF UREA DERIVATIVES

Mamoru Nakai; Fumio Iwata, and Teruhiko Inoue, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

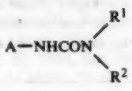
Filed May 19, 1983, Ser. No. 496,179

Claims priority, application Japan, May 25, 1982, 57-87276

Int. Cl.³ C07B *29/00*; C07C *126/00*; C07D *213/89, 263/48*

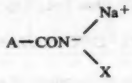
U.S. Cl. 546—306 **7 Claims**

1. A process for the preparation of a urea derivative having the formula:

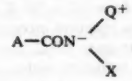


in which A represents a straight- or branched-chain alkyl group having 1–20 carbon atoms, an aryl group, or a heterocyclic group, and each of R^1 and R^2 represents hydrogen, a straight- or branched-chain alkyl group having 1–20 carbon atoms, an alicyclic group, or an aryl groups, which comprises:

reacting sodium salt of an N-halogenamide having the formula:



in which A is the same as above, and X represents halogen, with a quaternary ammonium salt to obtain its addition salt having the formula:



in which A and X are the same as above, and Q represents a quaternary ammonium, and then,

reacting said addition salt with an amine derivative having the formula:

in which each of R^1 and R^2 is the same as above, in the absence of a solvent or presence of an organic solvent.

4,514,572

PREPARATION OF FLUOROPHTHALIC ANHYDRIDES

Gerhard Hamprecht, Weinheim; Juergen Varwig, Heidelberg, and Wolfgang Rohr, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

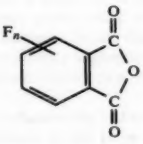
Filed Jan. 23, 1984, Ser. No. 572,949

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303378

Int. Cl.³ C07D *307/89*

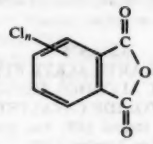
U.S. Cl. 549—246 **2 Claims**

1. A process for the preparation of a fluorophthalic anhydride of the formula



I

where n is 1 or 2, by reacting a chlorophthalic anhydride of the formula



II

where n has the above meanings, with potassium fluoride in the presence of an aliphatic sulfone as a solvent, wherein the chlorophthalic anhydride is treated with an acid chloride of sulfurous acid or of carbonic acid in the presence of the aliphatic sulfone at as high as 150° C., and the reaction mixture is then reacted with potassium fluoride at from 150° to 250° C.

4,514,573

ISOPRENYLAMINE DERIVATIVES

Yoshiyuki Tahara, Saitama; Yasuhiro Komatsu, Niiza; Hiroyasu Koyama, Ageo; Reiko Kubota, Hasuda; Teruhito Yamaguchi, Tokyo, and Toshihiro Takahashi, Ohi, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Saitama, Japan

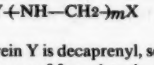
Filed May 12, 1982, Ser. No. 377,579

Claims priority, application Japan, May 18, 1981, 56-76156

Int. Cl.³ C07C *87/28, 101/48*

U.S. Cl. 564—387 **4 Claims**

1. An isoprenylamine derivative represented by the general formula



wherein Y is decaprenyl, solanesyl, or phytyl, m is zero or an integer of from 1 to 4 and when m is not zero the methylene groups are unsubstituted, or substituted by a hydroxyl or phenyl group, and X signifies substituted or unsubstituted phenyl, naphthyl or diphenylmethyl, wherein the substituents are nitro, methyl, dimethyl, chloro, mono-, di- or trimethoxy, amino, amino-methyl, carboxy, carboxy and hydroxy, or methoxy and hydroxy, and the acid addition salts thereof.

4,514,574

PROCESS FOR SEPARATING ISOMERIC MIXTURES

Kimio Inoue; Gale G. Hoyer, and Stanley I. Bates, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 9, 1984, Ser. No. 569,083

Int. Cl.³ C07C *85/26;* B01D *3/34*

U.S. Cl. 564—424 **17 Claims**

1. A process for separating a mixture of isomers of organic compounds comprising:

(a) contacting the mixture with a compressed gas under supercritical conditions such that the gas selectively takes up at least one isomer;

(b) separating the gas, including any of the mixture taken up by the gas in step (a), from the mixture not taken up by the gas in step (a); and

(c) separating at least part of the mixture taken up by the gas from the gas.

4,514,575

PROCESS FOR PREPARING TERTIARY PHOSPHINES

John Y. Lee, and Dennis P. Bauer, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 25, 1983, Ser. No. 554,901

Int. Cl.³ C07F *9/50*

U.S. Cl. 568—17 **8 Claims**

1. A process for converting a tertiary phosphine oxide to the corresponding tertiary phosphine which comprises reacting the tertiary phosphine oxide with a trichlorosilane reducing

agent in the presence of an inert halogenated hydrocarbon solvent at a temperature in the range of about 50°–250° C.

4,514,576

PRODUCTION OF ARYL ALKYL ETHERS FROM METHYLBENZYL ALCOHOL USING RHENIUM HEPTOXIDE CATALYST

Haven S. Kesling, Jr., Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 1, 1983, Ser. No. 510,022

Int. Cl.³ C07C *41/09*

U.S. Cl. 568—659 **11 Claims**

1. An improved process for the catalytic preparation of bis alpha-methylbenzyl ether from alpha-methylbenzyl alcohol in the presence of a catalyst wherein the improvement comprises contacting said alpha-methylbenzyl alcohol with a rhenium heptoxide catalyst.

4,514,577

CHEMICAL PROCESS FOR PREPARING DI-ORTHO BENZYL PHENOLS

Allen H. Filbey; Henry G. Braxton, Jr., both of Baton Rouge, La., and Bernard R. Meltsner, Royal Oak, Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 15, 1982, Ser. No. 434,827

Int. Cl.³ C07C *39/14, 37/16*

U.S. Cl. 568—744 **11 Claims**

1. A process for making benzyl substituted phenols, said process comprising contacting a mixture of a phenol and a benzyl alcohol in the vapor phase with an activated gamma alumina catalyst at a temperature in the range of 225°–450° C., said temperature being high enough to maintain said phenol and benzyl alcohol in the vapor phase at reaction conditions, said phenol having at least one position ortho or para to its phenolic hydroxyl group unsubstituted except for hydrogen.

4,514,578

PROCESS FOR THE PREPARATION OF TRIMETHYLOLPROPANE

Otto Immel; Hans-Helmut Schwarz; Hein Quast, and Eberhard Bandtel, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 466,693, Feb. 15, 1983, abandoned.

This application Jun. 22, 1984, Ser. No. 623,279

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207746

Int. Cl.³ C07C *31/22, 29/38*

U.S. Cl. 568—853 **18 Claims**

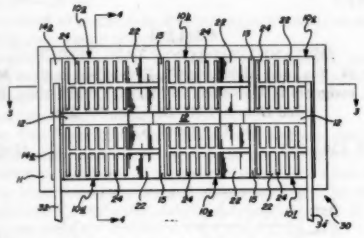
1. In a process for the preparation of trimethylolpropane by reaction of n-butyraldehyde with aqueous formaldehyde in the presence of an alkaline condensing agent, the improvement wherein the n-butyraldehyde is metered into a reaction mixture of water, alkaline condensing agent and formaldehyde, which contains less than 0.1 mol of methanol per mol of formaldehyde, at a temperature from 15° to 50° C. and, after addition of said butyraldehyde, the reaction mixture's temperature is increased to a temperature up to 90° C., the process being carried out in the presence of sufficient water such that the reaction mixture has a content of trimethylolpropane of 5 to 10% by weight after the reaction.

4,514,579

LARGE AREA PHOTOVOLTAIC CELL AND METHOD FOR PRODUCING SAME

Joseph J. Hanak, Lawrenceville, N.J., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jan. 30, 1984, Ser. No. 575,373
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—249 15 Claims



1. A large area photovoltaic cell formed of a plurality of small area photovoltaic segments arranged in a plurality of rows and columns, said small area segments in each of said rows electrically connected in series; said series connected rows of small area segments electrically connected in parallel; the large area cell comprising;

a. a common electrically insulating substrate member;

b. a plurality of discrete first small area electrodes formed on said substrate and electrically isolated from one another so as to form a plurality of rows and columns of small area electrodes; each first electrode having a surface divided into a major portion adapted to have semiconductor material deposited thereupon, and a minor portion adapted to be in electrical contact with a second electrode;

c. a discontinuous layer of semiconductor material adapted to generate an electrical current in response to illumination thereof, said discontinuous layer disposed on said plurality of discrete small area electrodes; said discontinuous layer forming a plurality of semiconductor bridges overlying the major portions of at least two adjacent first electrodes in a column and extending into portions of said substrate exposed between adjacent first electrodes in a row;

d. a plurality of discrete small area second electrodes electrically isolated from one another so as to form a plurality of rows and columns of small area second electrodes, each second electrode generally corresponding to and overlying the major portion of one of the underlying first electrodes; each second electrode electrically contacting (1) one of the semiconductor bridge portions extending onto said substrate between adjacent first electrodes in a row, and (2) the minor portion of the adjacent first electrode so as to series-connect each of said rows of small area photovoltaic segments; and

e. parallel connection means electrically connecting in parallel said rows of small area photovoltaic segments electrically connected in series; whereby a series-parallel connected large area photovoltaic cell exhibiting only proportional performance losses resulting from failures of small area photovoltaic segments thereof is provided.

7. A large area photovoltaic cell as in claim 1, further including:

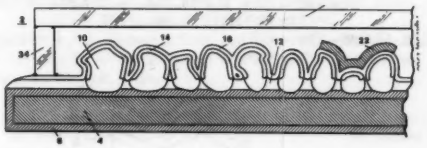
sealing means for electrically and environmentally isolating punctured portions of the large area cell from ambient conditions, whereby said cell is rendered resistant to the effect of puncture damage.

4,514,580

PARTICULATE SILICON PHOTOVOLTAIC DEVICE AND METHOD OF MAKING

Robert W. Bartlett, Tucson, Ariz., assignor to SRI International, Menlo Park, Calif.

Filed Dec. 2, 1983, Ser. No. 557,443
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—250 2 Claims



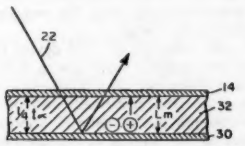
1. A hermetically sealed photovoltaic device comprising a substrate having an aluminum surface thereon with crushed p-type nonspherical silicon particles having a particle size range of 300–1000 micrometers sintered thereto to form an ohmic contact with said aluminum surface, an electrically insulating glass having a melting point of under 660° C. covering said crushed silicon particles and the aluminum surface of the interstices between adjacent particles, and n+ region formed in an exposed upper portion of said silicon particles to form p-n junctions in situ within said silicon particles, a transparent conductive coating comprising a tin oxide layer electrically contacting said n+ region, an electrode in ohmic contact with selective portions of said transparent conductive coating, and a transparent protective layer over said conductive layer providing a hermetic seal for said photovoltaic device.

4,514,581

SOLAR CELLS HAVING ULTRATHIN ACTIVE LAYERS

John C. C. Fan, Chestnut Hill, and Carl O. Bozler, Sudbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 57,874, Jul. 16, 1979, Pat. No. 4,376,228. This application Nov. 8, 1982, Ser. No. 440,090
The portion of the term of this patent subsequent to Mar. 8, 2000, has been disclaimed.
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 15 Claims



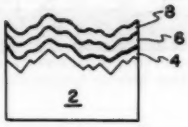
1. In a solar cell having an active semiconductor layer which has a minority carrier diffusion length, L_m, which is less than the solar spectrum absorption thickness, t_α:

The improvement of limiting said active layer to a thickness of less than L_m and greater than about 0.1 t_α and providing said active layer with a back surface reflector.

4,514,582
OPTICAL ABSORPTION ENHANCEMENT IN AMORPHOUS SILICON DEPOSITED ON ROUGH SUBSTRATE

Thomas Tiedje, Garwood, and Benjamin Abeles, Princeton, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 419,158, Sep. 17, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,546
Int. Cl.³ H01L *31/04, 31/18*
U.S. Cl. 136—256 11 Claims



1. A method for producing a thin film semiconductor device with enhanced absorption properties comprising:

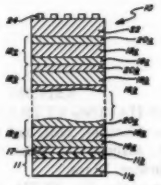
(a) sandblasting one surface of a dielectric substrate such that it randomly scatters incident light, wherein said sandblasted surface includes structures up to 100 μm; and

(b) depositing a thin film of semiconductor material on said dielectric sandblasted surface of said substrate, such that said structure is more than 50 times larger than the film thickness.

4,514,583
SUBSTRATE FOR PHOTOVOLTAIC DEVICES

Masatsugu Izu, Birmingham, and Vincent D. Cannella, Detroit, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 7, 1983, Ser. No. 549,055
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—259 1 Claim



1. In a photovoltaic device of the type comprising: a first electrode; an active semiconductor body electrically communicating with the first electrode, said semiconductor body adapted to generate a flow of electrical current in response to light energy incident thereupon; and a second electrode electrically communicating with the semiconductor body; the improvement comprising:

a composite substrate for said device including (1) a relatively thick support layer having at least one substantially planar surface, and (2) a relatively thin, flexible, substantially defect free, electrically insulating layer formed of a synthetic polymeric material disposed atop the planar surface of the support layer, said electrically insulating layer characterized by a textured surface, the textured surface formed by features sized and shaped so as to substantially enhance the absorption of light by the semiconductor body;

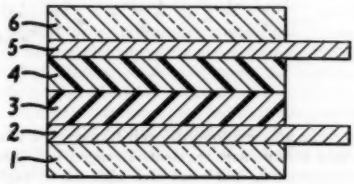
a light reflective body conformally disposed atop the textured surface of the insulating layer, said light reflective body forming the first electrode;

whereby said support layer provides (1) structural support for the electrodes and the semiconductor body of the photovoltaic device, and (2) vertical electrical insulation between the substrate and the first electrode of said photovoltaic device.

4,514,584
ORGANIC PHOTOVOLTAIC DEVICE

Sidney W. Fox, and Aleksander T. Przybylski, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Dec. 9, 1982, Ser. No. 448,236
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—263 13 Claims

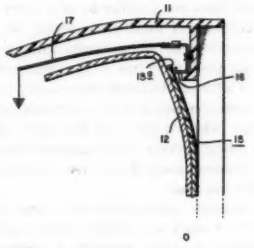


1. A photovoltaic device having as its photoactive electron donor component a thermal condensation polymer of at least one monoaminodicarboxylic acid and having as its photoactive electron acceptor component a thermal condensation polymer of at least one basic amino acid, said polymers containing both photoactive flavin and pterin pigments.

4,514,585
FILTER AND METHOD OF MANUFACTURING

Richard D. Paynton, P.O. Box 889, Doylestown, Pa. 18901

Filed Nov. 18, 1982, Ser. No. 442,633
Int. Cl.³ H05K *9/00*
U.S. Cl. 174—35 GC 12 Claims



1. A filter for use in transmitting visible light and absorbing other forms of energy, comprising a translucent substrate, a fine mesh of electrically-conductive filaments disposed on said substrate, a thin layer of bonding agent impregnating said mesh and bonding it to said substrate, said layer of bonding agent constituting a surface of said filter having a peripheral margin, and means along at least a portion of said peripheral margin of said filter providing electrical communication to said filaments.

4,514,586

METHOD OF USING A SHIELDING MEANS TO ATTENUATE ELECTROMAGNETIC RADIATION IN THE RADIO FREQUENCY RANGE

John Waggoner, Ft. Wayne, Ind., assignor to Enthone, Inc., New Haven, Conn.

Continuation of Ser. No. 412,916, Aug. 30, 1982, abandoned. This application Jul. 27, 1984, Ser. No. 635,125

Int. Cl.³ H05K 9/00

U.S. Cl. 174—35 MS 4 Claims

1. A method of attenuating electromagnetic radiation in the radio-frequency range comprising:

attenuating such radiation with means comprising an electrically nonconductive material forming an enclosure and having:

an inner and outer surface;

a pore free layer of copper metal of a uniform thickness electrolessly deposited on at least one surface of said enclosure, said layer of copper metal being of a thickness of at least 5 microinches and at least sufficient to render electrically conductive the thus coated surface of said enclosure; and

a second layer, selected from the class consisting of nickel, cobalt, gold and alloys thereof, electrolessly deposited and overlying the copper layer, to provide a combined metal layer, the second layer being of a thickness of at least 5 microinches and at least sufficient to protect the copper layer from oxidation;

the combined metal layer providing shielding of 20 dB or more against radio-frequency radiation over the range of 10 kilohertz to 1,000 megahertz.

4,514,587

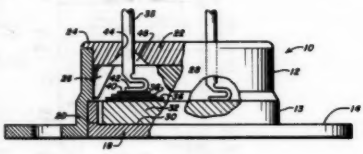
HIGH POWER SEMICONDUCTOR PACKAGE

Herman F. Van Dyk Soerewyn, Peabody, Mass., assignor to Unitrode Corporation, Peabody, Mass.

Filed Dec. 23, 1981, Ser. No. 333,732

Int. Cl.³ H05K 5/04

U.S. Cl. 174—52 H 14 Claims



1. A power semiconductor package comprising:

a metal header having a cylindrical section and a peripheral mounting flange adapted for attachment to a mounting surface, the cylindrical section having an annular portion adjacent the mounting flange;

a thermally conductive metallic disk having spaced-apart surfaces and a peripheral circumferential wall mounted in the annular portion of the cylindrical section with the peripheral circumferential wall of the cnductive disk in frictionally abutting relation with the confronting wall of the annular portion, and with one of said spaced surfaces disposed within said cylindrical section and with the other one of said spaced surfaces substantially coplanar with the mounting surface of the flange;

one or more die assemblies each mounted on said surface of the disk within the cylindrical section;

an electrically insulating cap secured to the cylindrical section and having openings therethrough;

a plurality of electrical terminals, each extending through a respective opening in the cap, accessible from the same side as the mounting surface on which the package will be mounted;

means electrically connecting each die assembly to a respective terminal; and

an encapsulant within the cylindrical section enclosing the die assemblies.

4,514,588

ENCAPSULATED ELECTRONIC COMPONENTS AND ENCAPSULATION COMPOSITIONS

William H. Beever; Robert S. Shue, and Clifford W. Childers, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1982, Ser. No. 453,973

Int. Cl.³ B29C 6/00; C08L 91/00

U.S. Cl. 174—52 PE 51 Claims

1. An article of manufacture comprising an electronic component encapsulated with a composition; wherein said composition comprises

(a) poly(arylene sulfide) and

(b) hydrogenated conjugated diene/monovinyl-substituted aromatic copolymer; wherein said copolymer consists essentially of conjugated diene monomer and monovinyl-substituted aromatic monomer.

4,514,589

ELECTRODE CONNECTING CABLE FOR CARDIAC PACEMAKER

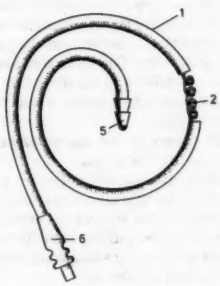
Fritz Aldinger, Rodenbach; Albrecht Bischoff, Bruchköbel; Richard Keilberth, Kleinheubach, and Franz Sperner, Hanau am Main, all of Fed. Rep. of Germany, assignors to Heraeus Quarschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Aug. 27, 1982, Ser. No. 412,292

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134896

Int. Cl.³ H01B 7/04, 5/08, 1/02; A61N 1/04

U.S. Cl. 174—119 R 10 Claims



1. Electrode connecting cable for a cardiac pacemaker having a cover tube of elastic electrically insulating material and at least one conductor strand enclosed therein for electric stimulating pulses, said conductor comprising a core of a metal of high electrical conductivity and a cladding of a corrosion resistant, non-toxic metal, further comprising the improvement, according to the invention, wherein:

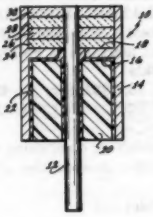
each said conductor strand is a die-drawn clad wire, of which the cladding layer is of a metal selected from the group consisting of tantalum, titanium, zirconium, niobium, titanium-base alloys, platinum, platinum-iridium alloys, platinum-palladium alloys and platinum-rhodium alloys, having a thickness in the range from 0.0025 to 0.035 mm, and

the core of said conductor is cylindrical when the wire is straight and its diameter is in the range from 0.04 to 0.3 mm.

4,514,590
ELECTRICAL TERMINAL ASSEMBLY

James C. Kyle, 610 Woodwillow St., Roseburg, Oreg. 97470

Filed Oct. 8, 1982, Ser. No. 433,528
Int. Cl.³ H01B 17/26
U.S. Cl. 174—152 GM 11 Claims



1. In combination,

a member having properties of conducting electricity,

an insulating member made from a hydrocarbon material and providing an electrical insulation in a temperature range between ambient temperature and temperatures of approximately 400° F. and in a pressure range between atmospheric pressure and pressures of at least 60,000 psi, and

a sealing material having electrically insulating properties through the range of temperatures between ambient and approximately 400° F. and through the range of pressures between atmospheric and at least 60,000 psi and hermetically sealing the electrically conductive member and the insulating member and retaining this hermetic seal in the temperature range between ambient temperature and approximately 400° F. and in the pressure range between atmospheric pressure and at least 60,000 psi,

the sealing material being made from an epoxy,

the electrically conductive member being provided with a first flat surface and the insulating member being disposed adjacent the first flat surface and the sealing material being disposed at the first flat surface between the electrically conductive member and the insulating member to seal the electrically conductive member and the insulating member hermetically,

a second flat surface on the electrically conductive member opposite the first flat surface,

the electrically conductive member having a particular coefficient of thermal expansion, and

means disposed on the second flat surface for providing an electrical insulation and hermetically sealed to the second flat surface and having substantially the particular coefficient of thermal expansion.

4,514,591
GLAZE TO PIN CONNECTION FOR A HIGH VOLTAGE DIRECT CURRENT INSULATOR WITH EMBEDDED METAL FITTING

Edward S. Wheeler, Batavia, N.Y., assignor to Interpace Corporation, Purchase, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,885
Int. Cl.³ H01B 17/08, 17/50
U.S. Cl. 174—182 5 Claims

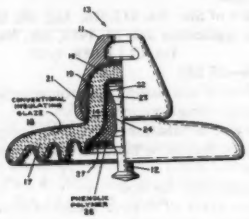
1. In an electrical insulator for use on positive polarity direct current transmission lines, comprising in combination:

a suitably contoured porcelain shell with a conventional insulating glaze;

a metal cap and a metal pin each situated at a surface of the insulator shell opposite to the other, the insulator shell forming a pin recess receiving the pin;

capping means securing mechanically the cap to the shell; and

Portland cement in the recess and about the pin securing mechanically to the shell the pin located in the recess; the improvement comprising a phenolic polymer composition having long term weather resistance and being connected

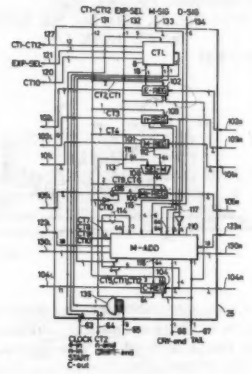


between the pin and the glaze and substantially sealing the Portland cement from contact with moisture in the air, the phenolic polymer composition having a non-ionic electrical conductivity substantially greater than the conductivity of the Portland cement.

4,514,592
CRYPTOSYSTEM

Shoji Miyaguchi, Yokohama, Japan, assignor to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,016
Claims priority, application Japan, Jul. 27, 1981, 56-117499; Oct. 19, 1981, 56-166777; Jun. 21, 1982, 57-106567
Int. Cl.³ H04L 9/04
U.S. Cl. 178—22.11 22 Claims



21. A cryptosystem in which integers M, e and n ($0 \leqq M < n$) are applied to M, e and n registers; variables C and M_2 are stored in C- and M_2-registers; the integer e being represented by

$$e = \sum_{i=0}^{k} \cdot e_i \cdot 2^i$$

(e_i=0 or 1); the variable C is initially set to 1; repetitive calculations are performed in accordance with the following Steps (1) and (2) for each value i in the order i=k, k−1, k−2, . . . 1, 0; in Step (1) an operation $C \equiv M_1 \times M_2 \bmod n$ is performed with M_1=C and M_2=C; in Step (2), the value of e_i is checked and if e_i=1, the operation $C \equiv M_1 \times M_2 \bmod n$ is further performed with M_1=C and M_2=M; and said repetitive calculations are completed with i=0, producing the last C in the form of $C \equiv M^e \bmod n$;

said cryptosystem comprising a main adding unit including at least an $M_1 \cdot M_{2j}$ calculating section for calculating $M_1 \times M_{2j}$, a $-Q_j n$ calculating section for calculating $-Q_j'' \times n$, a selector for selecting one of the calculation results $M_1 \cdot M_{2j}$ and $-Q_j'' \cdot n$, an adding register and an adder for adding the content of said adding register and the output of said selector and storing the addition result in said adding register, a controller, and a quotient calculating unit;

wherein a 0 is applied as a variable Z to said adding register, said calculation result $M_1 \cdot M_{2j}$ is selected by said selector, an operation $Z = Z + M_1 \times M_{2j}$ is performed in the order $j = 1, 2, \ldots l$ to obtain $M_1 \cdot M_2 = Z$, then R_{l+1} of

$$Z = \sum_{j=1}^{2l} \cdot Z_j \cdot 2^{(j-1)\lambda} \quad (\lambda \text{ being a constant})$$

$$R_{l+1} = \sum_{i=l+1}^{2l} \cdot Z_j \cdot 2^{(j-l-1)\lambda}$$

is applied to said adding register, said calculation result $-Q_j'' \cdot n$ is selected by said selector, said quotient calculating unit comprises a calculating section for calculating $X_j = [2^{\lambda} \cdot R_j 2^{-m}] + S$ (S being a constant) and a calculating section for calculating

$$v = \left[\frac{2^u}{[n \cdot 2^{-m}]} \right],$$

and said quotient calculating unit is controlled by said controller to calculate

$$Q_j'' = [X_j \times v \times 2^{-u}] + 1$$

when

$$X_j \geqq 0$$

$$Q_j'' = [X_j \times v \times 2^{-u}]$$

when

$$X_j < 0$$

or

$$Q_j'' = [X_j \times v \times 2^{-u}] + 1$$

when

$$X_j > 0$$

$$Q_j'' = [X_j \times v \times 2^{-u}]$$

when

$$X_j \leqq 0$$

and calculate $R_j = 2^{\lambda} \cdot R_j + R_j - Q_j'' \cdot n$ in the order $j = l, l-1, \ldots 1$;

wherein compensation calculation means is included for calculating, when $R_1 \geqq 0$, $R_1 = R_1 + n$ until $R_1 \geqq 0$ is obtained;

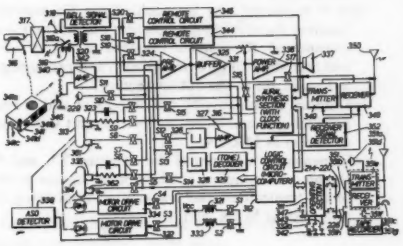
wherein said main adding unit is divided into a plurality of sliced sections of the same function, said M_1 and n are applied to said sliced sections while being sequentially divided for each fixed width of their integers, said M_{2j} and Q'' are applied to said sliced sections in common to them, said sliced sections each perform said operations $Z = Z + M_1 \times M_{2j}$ and $R_j = 2^{\lambda} R_{j+1} + Z_j - Q_j'' \cdot n$ for the M_1, n, Q_j'' and M_{2j} applied to them, said sliced sections are each connected to a higher-order one of them via a first connection signal line for applying thereto one part of the calculation result Z, and said sliced sections are each connected to a lower-order one of them via a second connection signal line for applying thereto the calculation result R_j.

4,514,593

AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS

Motoichi Hattori, Fujisawa, and Hideyasu Ishigo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 29, 1983, Ser. No. 518,409
Claims priority, application Japan, Jul. 30, 1982, 57-133526
Int. Cl.³ H04M 1/64
U.S. Cl. 179—2 A **2 Claims**



1. An automatic telephone answering and recording apparatus for communicating between calling and called subscriber stations in a telephone system, comprising:

a speaking circuit provided at a called subscriber station;

first means operating in response to a call signal from a calling subscriber station transmitted over a telephone line to connect said speaking circuit to the telephone line associated with the calling subscriber station;

a recording/reproducing means coupled to said speaking circuit for recording an incoming message from the calling subscriber station in its recording mode of operation, and transmitting a previously recorded incoming message to the telephone line through said speaking circuit in its reproducing mode of operation;

selection means for selecting the operation mode of said recording/reproducing means; and

control means connected between said speaking circuit and said selection means for controlling said selection means, said control means including a voice recognition means and a previously registered specific message from a subscriber and being operative to control said selection means to select the recording mode when said voice recognition means receives an incoming message from a calling subscriber station, and to select the reproducing mode when it receives a message corresponding to the previously registered message from the subscriber through the telephone line.

4,514,594

POWER LINE CARRIER TELEPHONE EXTENSION SYSTEM FOR FULL DUPLEX CONFERENCING BETWEEN TELEPHONES AND HAVING TELEPHONE CALL HOLD CAPABILITY

William M. Brown, Acton, and James R. Lindquist, Rowley, both of Mass., assignors to Astech, Inc., Greenwich, Conn.

Filed Sep. 30, 1982, Ser. No. 430,762
Int. Cl.³ H04M 11/00
U.S. Cl. 179—2.51 **19 Claims**

1. A power line RF carrier telephone extension system for signalling between (1) a telephone subscriber's telephone line of a conventional telephone communication system wherein a separate telephone line is provided from a central switching system at one location to each subscriber at the subscriber's

premises and each subscriber's telephone line includes at least two wires, the ring line and the tip line and, (2) each of one or more extension telephones by RF carrier over the available power line at the subscriber's premises, including at the subscriber's premises: a subscriber main station (M) near said subscriber telephone line and having access to said power line and one or more (up to N) subscriber extension stations (E1, E2 ---En--- EN), each having access to said power line, comprising,

(a) at the M station:

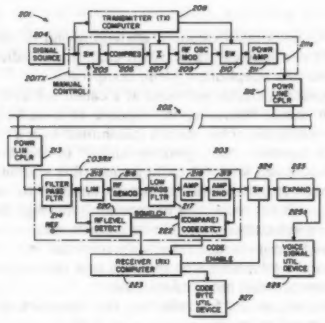
(a1) means connected to the telephone line for detecting audio frequency signals on the telephone line, referred to herein as TL signals,

(a2) an M transmitter including means for producing a main carrier frequency, Fm, and modulating means for modulating Fm,

(a3) N receivers, one for each of the En stations, each receiver for receiving a different one of the En stations transmitted RF carrier frequencies, F_1, F_2--Fn---FN and including an F_n demodulator, and producing modulations of Fn in the output thereof,

(a4) means for combining the outputs of said N receivers, producing a combined receiver output signal, referred to herein as MRXN,

(a5) means for combining the detected TL and MRXN signals and, coupling the combined signals to the input of the transmitter, said transmitter input being referred to herein as MTX, and



(a6) means for coupling the transmitter output to the power line, whereby the power line carries the modulated Fm to the NE stations; and at each E station, denoted generally as En:

(b1) an En telephone,

(b2) a source of power for the En telephone, whereby the En telephone produces audio and dial signals when it is used,

(b3) an En receiver for modulated Fm including an Fm demodulator, and producing the modulations of Fm in the output thereof, referred to herein as EnRX,

(b4) means for coupling modulated Fm from the power line to the input of the receiver and

(b5) means for coupling said EnRX to the En telephone, whereby the En telephone receives the TL and MRXN signals,

(b6) the extension telephone producing information signals, which may include audio and data signals, and dial signal and a telephone line hold signal when it is used by the subscriber,

(b7) an En transmitter including means for producing the En telephone carrier frequency, Fn and modulating means for modulating Fn by the En telephone audio signals and signals representative of the En dial signals and hold signal producing modulated Fn and

(b7) means for coupling the modulated Fn to the power line, whereby the power line carries the modulated Fn to the main station and telephone calls from the telephone line can be answered by any one of the E_1, E_2-- En---EN telephones and any or all of the E_1, E_2 --E_n telephones can conference on a telephone line call, and further, at the main station:

(a7) means coupled to said means for detecting modulations (means (a3) hereof) for detecting said hold signal and

(a8) means responsive to the detected hold signal for connecting a hold impedance across the telephone line,

(a9) said hold impedance serving to hold a telephone call so long as it is connected across the telephone line.

4,514,595

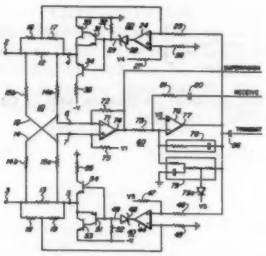
ACTIVE IMPEDANCE LINE FEED CIRCUIT

Stanley D. Rosenbaum, Ottawa, and Martin R. Handforth, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 10, 1982, Ser. No. 386,871

Int. Cl.³ H04M *1/74, 1/76, 19/00*

U.S. Cl. 179—16 F **7 Claims**



1. A line circuit for supplying energizing direct current to a pair of leads in a communication line, comprising:

a pair of line terminals for connection to the communication line;

first and second voltage amplifiers having first and second output terminals respectively;

a resistance network including, first and second feed resistors for connection in series between the respective first and second output terminals and respective ones of the pair of line terminals, the first and second resistors being of similar ohmic values, a first voltage divider being connected between the first output terminal and an end of the second feed resistor remote from the second output terminal and including a first voltage tap, and a second voltage divider being connected between the second output terminal and an end of the first feed resistor remote from the first output termial and including a second voltage tap;

a control circuit for causing the first and second voltage amplifiers to provide energizing direct current for the communication line via the first and second feed resistors in accordance with potentials appearing at the first and second voltage taps; and

wherein the resistance network further comprises:

a first network connected across the first feed resistor for providing a negative feedback signal to the first voltage amplifier;

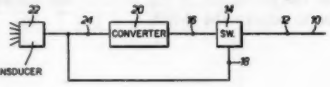
a second network, similar to the first network, connected across the second feed resistor for providing a negative feedback signal to the second voltage amplifier;

whereby common mode rejection of longitudinally induced a.c. signals on the communication line is enchanced.

4,514,596
TELEPHONE HANDSETS

Geoffrey M. Garner, and Anthony J. Salloway, both of Northampton, England, assignors to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 169,792, Jul. 17, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 384,184
Int. Cl.³ H04M 1/00
U.S. Cl. 179—84 T 3 Claims

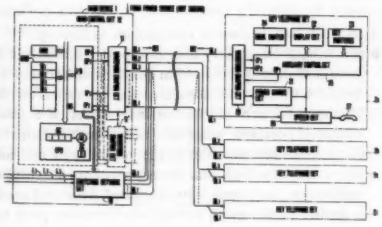


1. A telephone subscriber subset for use in a subscriber's handset, said subset being connected to receive signalling and speech signals from a telephone exchange including a transducer for generating audible signalling tones in response to an input thereto, and a detector circuit having input terminals for connecting with the subscriber's handset to distinguish between signalling and speech signals, the subscriber's handset including conversion means having an input for converting the input signals to substantially non-sinusoidal electrical waveforms, wherein speech signals and signalling signals are received at the input terminals of said detector circuit, said detector circuit including switch means having a first output connected to said transducer for providing said speech signals directly to the transducer so as to allow the transducer to be used as an earpiece, and having a second output connected to the input of said conversion means for providing said signalling signals as input signals to said conversion means for conversion to substantially non-sinusoidal electrical waveforms, said substantially non-sinusoidal waveforms being fed to the transducer to produce a low-frequency tone output signal.

4,514,597
CONTROL OF A KEY TELEPHONE SYSTEM USING A PULSE WIDTH MODULATED SIGNAL

Junzo Kikuchi, Kawasaki; Ryuzo Sugiura, Suginami; Mutsuhiro Yamamoto, and Toshiro Yoshida, both of Yokohama, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,189
Claims priority, application Japan, May 17, 1982, 57-82784
Int. Cl.³ H04M 1/72
U.S. Cl. 179—99 M 4 Claims

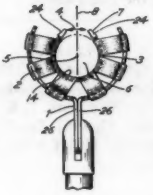


1. In a signal transmission system of a key telephone system of the type comprising a main device connected to office lines which includes a calculating processing unit having an input-/output port for transmitting and receiving signals, and a plurality of key telephone sets connected in parallel to said main device through a pair of signal lines for transmitting and receiving various control signals between said main device and said key telephone sets, the improvement wherein each of said control signals is constituted by a pulse width modulated time series signal of a predetermined number of bits, respective control signals are inputted and outputted in parallel to and from a bit input/output of said input/output port and wherein transmission and reception of said control signals between said main device and respective key telephone sets are simultaneously performed by parallel input/output operations of said calculating processing unit.

4,514,598
MICROPHONE SHOCK-MOUNTING APPARATUS

Gerald W. Plice, Morton Grove, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Jul. 20, 1983, Ser. No. 515,614
Int. Cl.³ H04R 1/02; H04M 1/04
U.S. Cl. 179—146 R 4 Claims



1. A shock-mounting apparatus for substantially vibrationally isolating a microphone comprising:

means for cradling the microphone, the cradle means defining a microphone cradling channel and a slot into the channel, the cradle means being flexible along the slot;

a mounting bracket; and

means for

(a) interconnecting the cradle means with the mounting bracket; and

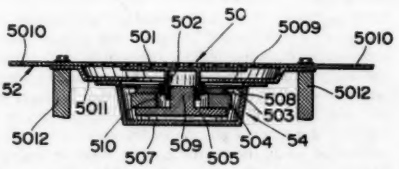
(b) substantially isolating the cradle means from environmental vibration transmitted to the mounting bracket;

whereby the cradle means flexes for receiving the microphone through the slot, cradles the microphone, and the apparatus substantially vibrationally isolates the microphone.

4,514,599
SPEAKER FOR AUTOMOTIVE VEHICLE AUDIO SYSTEM HAVING A VEHICLE PANEL SERVING AS SOUND-AMPLIFYING MEDIUM

Takayuki Yanagishima, and Junichi Kasai, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 329,875, Dec. 11, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 582,143
Claims priority, application Japan, Dec. 19, 1980, 55-180203; Apr. 18, 1981, 56-59006; Apr. 18, 1981, 56-56390[U]; Apr. 18, 1981, 56-56391[U]; Apr. 23, 1981, 56-58806[U]; Sep. 25, 1981, 56-142189[U]; Sep. 25, 1981, 56-142190[U]
Int. Cl.³ H04R 9/00
U.S. Cl. 179—181 W 18 Claims



1. A speaker for an automotive vehicle having an audio system comprising:

a vehicle panel which forms a part of a vehicle body and which is sufficiently flexible to oscillate at an audio fre-

quency, said vehicle panel comprising at least a section adapted to oscillate for producing an audio sound,

a housing fixed to said section, and

a driving unit resiliently suspended within said housing, associated with said audio system for receiving an audio signal produced by said audio system, and fixed to said section of said vehicle panel separately from said housing to drive said section for oscillation at an audio frequency for producing the audio sound, said driving unit comprising a support element secured to said vehicle panel, a coil wrapped around said support element, and a driver assembly having a permanent magnet positioned adjacent said coil for causing oscillations of said support element,

whereby said vehicle panel forms part of said vehicle body and also functions as a diaphragm member of the speaker for producing the audio sound.

4,514,600

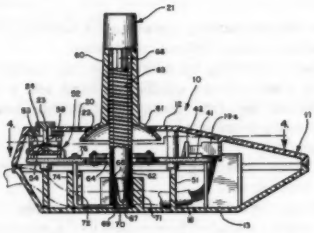
VIDEO GAME HAND CONTROLLER

James M. Lentz, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,225

Int. Cl.³ H01H *9/00, 25/00*

U.S. Cl. 200—5 R **9 Claims**



1. A hand operable controller for producing an electrical control signal in response to manipulation of the controller by a user comprising,

a housing having an interior and a floor portion within said interior, said housing having a raised support extending upwardly from the floor portion and having a mounting pillar formed on the floor portion, said mounting pillar having a bore recess formed therein, said housing further having an aperture formed in an upper portion thereof,

a mounting board positioned on the raised support of said housing, said mounting board having an aperture in a central portion thereof,

at least four electrical contact pads affixed to said mounting board around the aperture in the mounting board, each of said contact pads having an edge portion extending across the aperture in the mounting board, said edge portions positioned along a rectangle overlying the aperture in the mounting board,

a central contact member of electrically conductive material having a tubular shape, said central contact member forming a radial flexure and being affixed within the bore recess of the mounting pillar in the housing, and extending upwardly through the aperture in the mounting board,

an actuator stem positioned within said central contact member and having a tapered portion formed on an end thereof, said tapered portion of the actuator stem being positioned inside the central contact member within the bore recess of the mounting pillar and forming a pivot for the actuator stem and associated central contact member, and

a joystick member affixed to said actuator stem and extending upwardly through the opening in the upper portion of said housing, said joystick providing means for the user to flex the central contact member radially into electrical contact with the contact pads.

8. A hand operable controller as set forth in claim **1** further comprising a dome switch affixed on said mounting board and an elongated actuator bar positioned adjacent the dome switch, said actuator bar having a projection in the center thereof for engaging said dome switch, said actuator bar extending through a bar shaped opening in the upper portion of the housing, whereby depression of either end of the actuator bar moves the projection of the actuator bar against the dome switch to activate the switch.

4,514,601

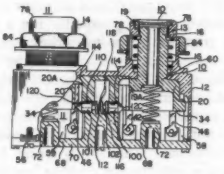
MULTISPEED INTERLOCKED PUSH BUTTON SWITCH MECHANISM

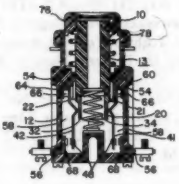
James D. Buchanan, Canton, N.C., assignor to Square D Company, Palatine, Ill.

Filed Nov. 8, 1983, Ser. No. 550,262

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—5 E **19 Claims**





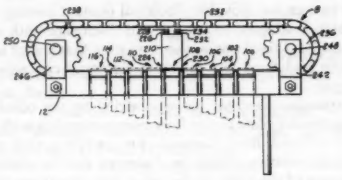
1. A push button switch mechanism including:

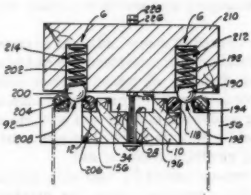
a pair of spaced linearly movable push buttons and an interlock and detent mechanism positioned between the push buttons to prevent simultaneous actuation of the push buttons and provide tactile indications of a plurality of operated positions when one of the push buttons is moved from an at-rest position to the plurality of operated positions, the interlock and detent mechanism comprising: a surface on each push button spaced from and confronting a similar confronting surface on the other push button, a detent surface including a plurality of notches spaced by dwell surfaces on each confronting surface, a pair of spaced movable pawls and a spring positioned in the space between the confronting surfaces with each pawl having a taper at an end that is biased by the spring into engagement with one of the detent surfaces and an abuttable surface on an end of each pawl that is remote from the tapered end, the abuttable surfaces on the pawls being spaced when at least one push button is at its at-rest position and engageable with each other to prevent simultaneous movement of both push buttons from the at-rest position.

4,514,602
SWITCHING APPARATUS

Donald W. Owen, 4619 Ridgeline Dr., Norman, Okla. 73069

Filed Dec. 27, 1982, Ser. No. 453,728
Int. Cl.³ H01H *15/00, 3/32*
U.S. Cl. 200—16 C 14 Claims





1. A switch, comprising:

support means, including:

a first plurality of connector terminals linearly disposed along a first side of said support means; and

a second plurality of connector terminals, in parallel relationship with said first plurality of connector terminals, linearly disposed along a second side of said support means so that each of said second plurality of connector terminals is aligned with a respective one of said first plurality of connector terminals;

a first common terminal, disposed on said support means and spaced from said first plurality of connector terminals, including a first elongated electrical conductor extending parallel to said first plurality of connector terminals;

a second common terminal, disposed on said support means and spaced from said second plurality of connector terminals, including a second elongated electrical conductor extending parallel to said second plurality of connector terminals;

connector means for electrically connecting a selected one of said first plurality of connector terminals to said first common terminal and for electrically connecting a selected one of said second plurality of connector terminals to said second common terminal; and

movement means for selectively moving said connector means.

4,514,603
DOOR OPERATED SWITCH ASSEMBLY

Paul R. Staples, Cub Run, Ky., assignor to E.M.B. Corporation, Elizabethtown, Ky.

Filed Feb. 21, 1984, Ser. No. 581,708
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.62 9 Claims

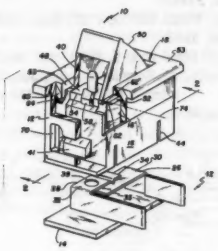
1. A door switch comprising

a housing having sidewalls and an open end,

a post carried in said housing,

a plunger carried by said post and engaging a switch means carried in said housing to open and close same,

a switch button actuating said plunger carried in said open end and trapped between said post and said housing, an



edge of said post providing a pivot axis against which said switch button is pivoted to actuate said plunger.

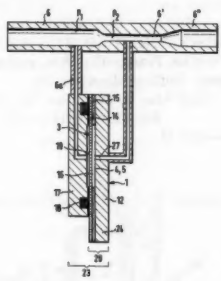
4,514,604
ARRANGEMENT FOR CONVERTING THE PRESSURE OF A MEDIUM INTO AN ELECTRICAL SIGNAL

Hermann Gmeinder, Warthausen-Oberhofen, and Georg Wenger, Schemmerhofen, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 478,526, filed as PCT EP 82/00151, Jul. 14, 1982, published as WO 83/00405 Feb. 3. 1983, § 102(e) date Mar. 16, 1983, abandoned. This application Jul. 17, 1984, Ser. No. 631,012

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128408

Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 N 14 Claims

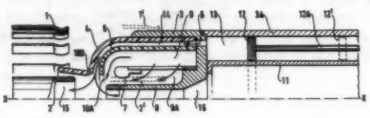


1. A unitary component for converting the pressure of a pressure medium into an electrical signal, said unitary component forming a flat membrane chamber (17) having a plate (12) of electrically non-conductive material with electrical contacts (4,5) arranged on one side of the plate in the chamber, and a pressure responsive membrane (14), reciprocated through the pressure of a pressure medium received from a pressure medium source (2), having an electrically conductive surface facing said electrical contacts for the electrical connection and disconnection of contacts (4,5), and an insulating plate (15) located intermediate said plate and said membrane (14), said insulating plate including a through aperture (16) to allow the membrane (14) to contact the contacts (4,5) of the sensor therethrough under the pressure of the pressure medium.

4,514,605
COMPRESSED GAS CIRCUIT BREAKER

Doan Pham Van, Meyzieu, France, assignor to Alsthom-Atlantique, Paris, France

PCT No. PCT/FR83/00003, § 371 Date Jul. 29, 1983, § 102(e) Date Jul. 29, 1983
PCT Filed Jan. 5, 1983, Ser. No. 522,369
Claims priority, application France, Jan. 5, 1982, 82 00034
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A 7 Claims

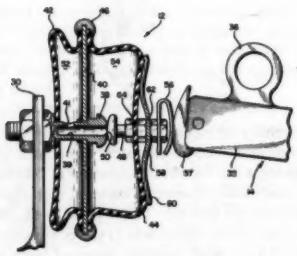


1. In a compressed gas circuit breaker including a first fixed arc contact (2), a second moving arc contact (7), said breaker being provided both with a blast device comprising a piston (12), a cylinder (3A) and means defining a blast orifice (10B) for sending a jet of compressed gas to the zone where an electric arc forms when the arc contacts (2, 7) separate, and means defining a volume (9) containing a gas suitable for being heated by the action of the arc, said means defining said volume including an opening (10A) to enable the hot gas to escape, said means defining said blast orifice (10B) and said opening (10A) being annular and disposed side by side, the improvement wherein said blast orifice (10B) is disposed at one end of an annular volume (4) delimited by a circularly symmetrical blast nozzle (14) and a circularly symmetrical deflector (5), said volume (9) being delimited by said deflector (5) and said second arc contact (7), and the opening (10A) of said volume being situated next to said blast orifice (10B), and said opening and said blast orifice being positioned relative to said first and second arc contacts, such that the opening (10A) of said volume and said blast orifice (10B) are closed by said first arc contact (2) when the circuit breaker is closed, and said opening (10A) and said orifice (10B) are opened in succession by relative displacement of the arc contacts (2, 7).

4,514,606
DISCONNECT SWITCH ASSEMBLY

Edward F. Veverka, Franksville, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed May 6, 1983, Ser. No. 492,360
Int. Cl.³ H01H *33/12*
U.S. Cl. 200—146 R 10 Claims



1. A disconnect switch assembly, comprising:

(a) a fixed electrical contact, defining a free end and a fixed end, having hollow bore open to said free end and an opening, communicating with said bore, which is disposed intermediate the ends of said fixed contact;

(b) a two-sided divider plate carried by said fixed contact and disposed intermediate the ends of said fixed contact with said opening on one side of said plate;

(c) wall means, adapted to be filled with an arc extinguishing fluid and in flow communication with said opening, for forming a volume chamber on said one side of said divider plate;

(d) a two-ended movable electrical contact having one end which is adapted to engage and disengage with said free end of said fixed contact so as to plug that end of said bore when said fixed and movable electrical contacts are engaged;

(e) expansion chamber means, carried by the other side of said divider plate and in flow communication with the free end of said fixed contact, for carrying said movable contact relative to said fixed contact and for changing the volume of the fluid on the other side of said divider plate in response to the position of said movable contact relative to said fixed contact;

(f) snap-action means, carried by said movable contact, for rapidly disengaging said movable contact from said fixed contact;

(g) releasable operating means, adapted to engage with and make electrical contact with the other end of said movable contact and to make electrical contact with said fixed electrical contact, for overcoming said snap-action means and forcing said fixed contact and said movable contact together and for shunting said fixed electrical contact and said moving electrical contact; and

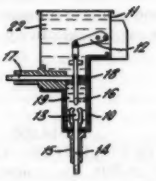
(h) camming means, caried by said snap action means and said releasable operating means, for breaking the shunt across said fixed and moving electrical contacts before separating said fixed and moving electrical contacts and for mating said fixed and moving electrical contacts before shunting said contacts,

whereby upon the release of said operating means, said snap-action means quickly separates said fixed and said movable electrical contacts and, in the event that current is passing through said fixed and moving contacts, an electrical arc is formed across said contacts, the arc drawn across said contacts being extinguished by the fluid flowing from said volume chamber into said expansion chamber means through the bore in said fixed contact.

4,514,607
ELECTRICAL CIRCUIT INTERRUPTING DEVICES

Harold Lloyd, Dorset, and David S. L. Slinn, Bristol, both of England, assignors to The Electricity Council, London, England

Filed Apr. 9, 1982, Ser. No. 366,909
Claims priority, application United Kingdom, Apr. 13, 1981, 8111683
Int. Cl.³ H01N *33/75, 33/22*
U.S. Cl. 200—150 A 14 Claims



1. An electrical circuit interrupting device comprising a housing having relatively movable contacts and at least one contact operating mechanism, which housing contains two immiscible fluids in contact with one another, which fluids are both liquid at ambient temperature, one being relatively dense first liquid constituting an arc interruption medium in which the contacts are immersed and the other less dense non-flamm-

able dielectric and coolant second liquid which forms a separate phase with respect to the first liquid, the volume of the second liquid being greater than that of the first liquid, the second liquid forming a cooling medium for condensing vapour produced by the arc.

4,514,608

LOCKING TYPE PUSHBUTTON SWITCH

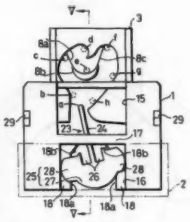
Taneo Murata, Iwaki, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

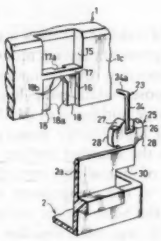
Filed Dec. 5, 1983, Ser. No. 558,326

Claims priority, application Japan, Dec. 3, 1982, 57-182482[U]; Dec. 3, 1982, 57-182483[U]

Int. Cl.³ H01H *13/56*

U.S. Cl. 200—153 J **2 Claims**





1. A locking type pushbutton switch having a casing defined in part by a side wall, a stem portion movable parallel to said side wall for actuating the switch upon movement inwards of said casing and having a cam groove formed on a side surface thereof, and means including a locking pin having an end portion fitting within said cam groove for holding said stem in its position inwardly of said casing, said locking pin including a mounting portion adapted to be held within a recess of said side wall for rotation parallel therewith, an elongate pin part extending outwardly from said mounting portion to a free end and adapted to lie generally along said side wall, and a bent part extending normally from said free end to said end portion so that said elongate portion can be flexed to press said end portion resiliently against said cam groove.

4,514,609

PUSHBUTTON SWITCH HAVING LEAF-SHAPED CONTACT SPRING

Reinhard L. Fricke; Klaus Hinze; Manfred K. O. Huth, and Klaus B. Wisskirchen, all of Berlin, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,393

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140199

Int. Cl.³ H01H *3/12, 1/18*

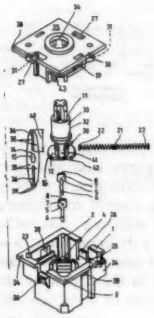
U.S. Cl. 200—159 A **1 Claim**

1. An electrical pushbutton switch comprising, in combination:

a casing having an axis, axially extending wall portions, a base portion and at least two radially spaced stationary contacts mounted to said base and extending axially upwardly

a rod-shaped switch plunger axially movable in said casing and having a pair of arms extending in radially opposite directions from an axially intermediate portion of said plunger, said plunger including an axially inner end portion and an axially outer end portion;

a leaf spring contact mounted at a central portion thereof to the axially inner end portion of said plunger and extending outwardly in radially opposite directions therefrom for engaging said stationary contacts when said plunger is moved toward said base;



a compression spring extending through a transverse through bore in an intermediate portion of said plunger and respectively terminating in radially opposite groove portions of said wall portions of said casing, said compression spring resiliently urging said plunger away from said base; and,

a cover enclosing the axially outer end portion of said casing and having a central opening for receiving said plunger and said cover having a pair of axially extending radially opposite guide grooves for receiving radially outer ends of said arms for guiding and angularly orientating said plunger.

4,514,610

Patent Not Issued For This Number

4,514,611

METHOD OF CONTROLLING ELECTRIC DISCHARGE MACHINE

Mitsuo Matsui, Tokyo, and Teruyuki Matsumura, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Jul. 16, 1982, Ser. No. 398,904

Claims priority, application Japan, Jul. 21, 1981, 56-114057

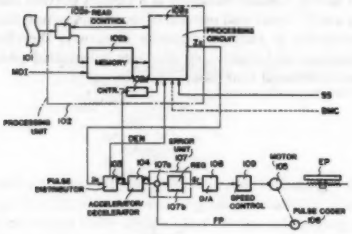
Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 M **5 Claims**

1. A method of controlling an electric discharge machine having an advance control step for relatively moving and controlling in a forward direction an electrode and a workpiece to which a voltage is applied, thereby to perform electric discharge machining on the workpiece, by the use of an elec-

tric discharge caused between the electrode and the workpiece and a retraction control step of relatively moving and controlling the electrode and the workpiece in a backward direction in accordance with a retraction command, in the method of controlling the electric discharge machine, the retraction control step comprising the steps of:

determining a state of the electric discharge machining in accordance with said retraction command;



selecting a class corresponding to the electric discharge machining state from among a plurality of differing stored classes of retraction control information items indicating retracting control conditions different from one another and each differing class including a different retraction limit and a different retraction speed; and

moving and controlling said electrode and said workpiece relatively in the backward direction on the basis of the selected class of retraction control information items.

4,514,612

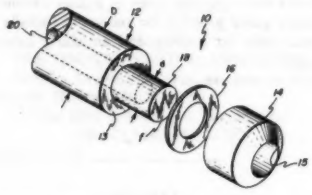
COMPOSITE RESISTANCE SPOT WELDING ELECTRODE

Herman A. Nied, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,833

Int. Cl.³ B23K *11/30*

U.S. Cl. 219—119 **2 Claims**



1. A composite resistance spot welding spherical end electrode comprising:

a one-piece cylindrical electrode having a base portion of a first diameter and an axial stem portion of a second reduced diameter providing a shoulder on said base portion, said stem portion terminating in a spherical end face that has a central axis cavity;

a first washer-shaped insulating spacer placed over said stem portion against said shoulder and a second insulating spacer interiorly positioned within said central cavity;

a high strength, high electricl resistivity plug in said central cavity that bears on said second insulating spacer and has an exterior spherical end face;

a high strength, high electrical resistivity annular outer sleeve on said stem portion which has a flat end face positioned against said first insulating spacer and a spherical end face that forms a smooth continuous surface with said stem portion and plug spherical end faces;

said plug absorbing the peak contact pressure built up on the electrode face central region during a weld operation and said second insulating spacer reducing the localized current and joule heating at that location, whereby plastic deformation and deterioration of the electrode end face is substantially mitigated.

4,514,613

METHOD OF AN APPARATUS FOR WELDING TOGETHER METAL COMPONENTS

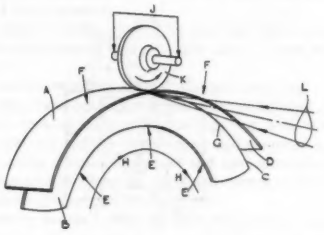
Michael Hill; John H. P. C. Megaw, both of Oxford, England, and Howard Harvey, Caerleon, Wales, assignors to Lucas Industries PLC, Great King St., Birmingham, England

Filed May 11, 1982, Ser. No. 377,157

Claims priority, application United Kingdom, May 21, 1981, 8115638

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 EC **33 Claims**



1. A method of welding together arcuate metal components of high restraint geometry having arcuate surfaces to be joined, comprising: supporting the components with said arcuate surfaces in juxtaposed relationship; applying a first force to the components to urge said surfaces firmly into abutting relationship; directing a high energy density beam at the junction formed between the abutting surfaces to effect welding at a localized region of mutual abutment thereof; and applying an additional force to the components adjacent to the area of impingement of the beam on the component at said localized region sufficient to urge them together at said localized region, in order to compensate for stresses set up therein during welding.

4,514,614

PRESSURE-DIFFERENTIAL METHOD FOR SLEEVE-TO-TUBE JOINING

Israel Stol, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 18, 1982, Ser. No. 409,208

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—125.11 **10 Claims**

1. A method for welding a metal sleeve within a metal tube comprising:

positioning a metal sleeve in a metal tube;

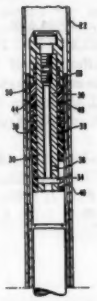
inserting a welding apparatus in said sleeve to position a welding electrode near the portion of said sleeve to be welded;

actuating a sealing mechanism of said welding apparatus thereby defining a sealed chamber between siad sleeve and said welding apparatus near the portion of said sleeve to be welded;

introducing an inert shielding gas through said welding apparatus and into said sealed chamber for pressurizing said sealed chamber to between approximately 5 to 150 psi;

activating said welding apparatus to produce, through said electrode, a current of between approximately 2–150 amps for welding said sleeve to said tube while said shielding gas gently forces the molten weld material outwardly

toward said tube thereby cushioning the weld arc force during the welding process; and



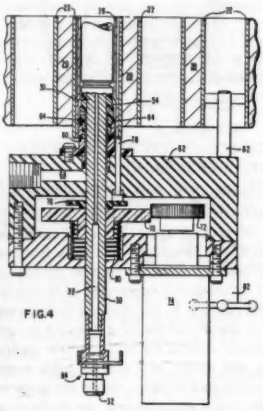


FIG.4

rotating said welding apparatus about its longitudinal axis for completing a weld around the circumference of said sleeve.

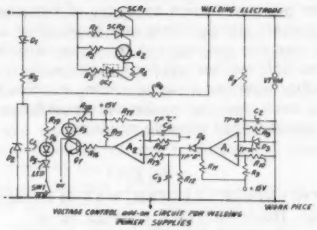
4,514,615

PROTECTION CIRCUIT AGAINST ELECTRIC SHOCKS DURING WELDING

Raynald Simoneau, St. Bruno; Jean-Marc Pelletier, St. Louis de Terrebone; Antonio Di Vincenzo, Ville d'Anjou, and Jean-Paul Boillot, Beloeil, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Continuation of Ser. No. 360,560, Mar. 22, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,628
Claims priority, application Canada, Dec. 8, 1981, 391754
Int. Cl.³ B23K 9/10
U.S. Cl. 219—132 **16 Claims**

1. A circuit for controlling the power supply to a shielded electrode of the type used in a shielded metal arc welding process (SMAW) whereby to protect a user from electric shocks, said circuit comprising a measuring circuit for determining the dynamic impedance value between said electrode and a workpiece to be welded; and a power feeding device connected in series with said power supply and said electrode, the power feeding device being controlled by said impedance measuring devie so as to render conductive said power feeding device when the dynamic impedance value detected by said measuring device reaches a level value lower than a predetermined threshold impedance value for delivering power to said electrode, said predetermined threshold impedance value being set at about 500 ohms whereby a wet human body will



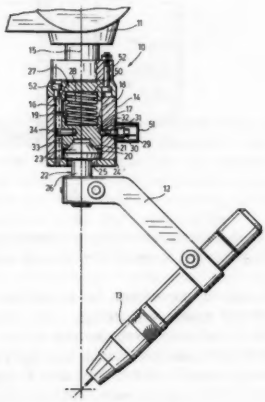
not be subjected to an electrical shock when the body contacts the electrode and the workpiece simultaneously.

4,514,616

SAFETY MOUNTING DEVICE

Michael V. Warner, Brampton, Canada, assignor to Rumble Equipment Limited, Rexdale, Canada

Filed Sep. 11, 1984, Ser. No. 649,529
Int. Cl.³ B23K 9/28
U.S. Cl. 219—136 **6 Claims**



1. A safety mounting device comprising a housing having a longitudinal axis; a first movable member mounted within said housing for sliding movement along said longitudinal axis; a second movable member mounted within said housing between said first movable member and a stop member, said second movable member being mounted within said housing for sliding movement along said longitudinal axis, for rotation about said longitudinal axis and for tilting movement with respect to said longitudinal axis; biasing means for biasing said first movable member against said second movable member to sandwich said second movable member between said first movable member and a stop member; and switch means having an on position and an off position and operable by said first movable member, in one position of said first movable member along said longitudinal axis said switch means being in one of its two positions, in other positions of said first movable member along said longitudinal axis said switch means being in the other of its two positions; said first and second movable members contacting each other by means of a cam surface and a cam follower surface such that rotation of said second movable member about said longitudinal axis from a home position wherein said first movable member is in its said one position

displaces said first movable member by cam surface-cam follower action to said other positions thereof, said first movable member also being movable from said one position thereof to said other positions thereof by virtue of movement of said second movable member along said longitudinal axis toward said first movable member and by virtue of tilting of said second movable member relative to said longitudinal axis.

6. A safety mounting device according to claim 1 including a welding torch mounting bracket and means for securing said bracket to said second movable member.

4,514,617

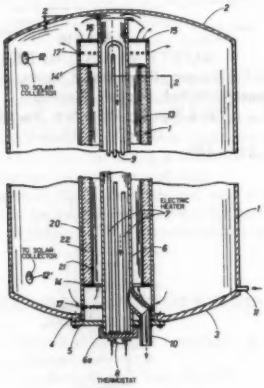
TWO-STAGE ELECTRIC WATER HEATER

Haim Amit, House No. 213/1, Yokneam, Israel

Filed Jan. 19, 1983, Ser. No. 459,109

Int. Cl.³ H05B *1/02, 3/82;* **F24H** *1/20*

U.S. Cl. 219—314 **8 Claims**



1. A dual-purpose water heater consisting of a storage vessel and a heating unit inserted therein, said heating unit comprising:

an elongated, imperforate heater tube of a heat-conductive material within said storage vessel and having an outer, closed end attached to the wall of said storage vessel, and an inner, open end terminating short off the top of said storage vessel, said heater tube being provided with a water outlet pipe proximate its outer end, said pipe extending to the outside of the vessel;

an elongated resistance-type immersion heating element positioned in said heater tube parallel to the tube axis and extending from its outer end to near the inner end of said tube, said heating element being provided with electric terminals on the outside of said vessel;

a thermostatic switch having its feeler inserted into said heater tube from the outside of said vessel, for energizing said heating element in accordance with the water temperature within said tube;

an elongated tubular heat-insulating body in said vessel surrounding a major portion of the length of said heater tube concentrically and distanced therefrom so as to create a water passage of annular cross section between said insulating body and said heater tube, said insulating body being provided with at least one first opening communicating the interior of said vessel with said water passage proximate the outer end of said heater tube and with at least one second opening communicating the interior of said vessel with said water passage proximate the inner end of said heating element, said at least one second opening being positioned at a higher level than said at least one first opening for establishing a convective flow of water through said water passage from said first to said second opening.

4,514,618

COMPACT ELECTRIC HAIR DRYER

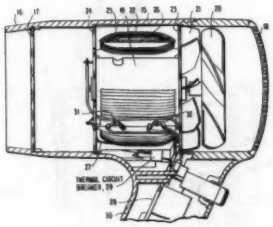
Rudolf Majthan, Schwalbach; Rolf Stühler, Wi-Delkenheim, both of Fed. Rep. of Germany; Raymond G. Parsonage, Maidenhead, and Charles C. Packham, Wockingham, both of England, assignors to Braun AG, Kronberg, Fed. Rep. of Germany

Division of Ser. No. 281,624, Jul. 9, 1981, abandoned, which is a division of Ser. No. 133,740, Mar. 25, 1980, Pat. No. 4,300,280.

This application Feb. 3, 1984, Ser. No. 576,772

Int. Cl.³ H05B *3/02;* **A45D** *20/08*

U.S. Cl. 219—370 **3 Claims**



1. A hairdryer comprising a hollow, elongated housing having air inlet and air outlet means located in opposite ends of said housing, a pair of spaced apart grates secured in said housing perpendicular to the direction of air flow from said air inlet means to said air outlet means, an electric motor extending lengthwise of said housing and supported at opposite ends by said grates in spaced relation to the housing to form annular air flow space between the motor and the housing around the entire motor, a fan wheel driven by said electric motor and disposed intermediate said motor and said air inlet means for creating a flow of air from said air inlet means through said air flow space around the motor and out said air outlet means, a hollow cylindrical body supported at opposite ends by said grates and disposed co-axially about said motor and an electric heating element wound about said cylindrical body and positioned in said air flow space to heat the air flowing therethrough from said air inlet means to said air outlet means.

4,514,619

INDIRECT CURRENT MONITORING VIA VOLTAGE AND IMPEDANCE MONITORING

Michael M. Kugelman, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,951

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—483 **3 Claims**

1. A circuit for monitoring electrical current from a source of power along lead line means to a load means comprising

switch means in said lead line means being sequentially operative from a first mode wherein load current may flow from the source of power to said load means, to a second mode wherein test current may flow along another line means for determining whether the impedance of load is the correct magnitude,

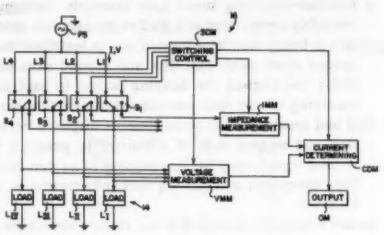
impedance measurement means operatively coupled with said switch means for determining impedance of the load means when said switch means is in the second mode,

voltage measurement means for determining the voltage present at the load means,

current determining means operatively coupled with said impedance measurement means and said voltage measurement means for determining load current being delivered

to the load means as a function of signals received from said impedance measurement means and said voltage measurement means,

switching control means for periodically changing said switch means from the first mode to the second mode and



for periodically rendering operative said impedance measurement means, voltage measurement means and current determining means, and

output means activated from said current determining means for response to whether or not the load means are being operated in a predetermined manner.

4,514,620

CONDUCTIVE POLYMERS EXHIBITING PTC CHARACTERISTICS

Tai C. Cheng, Mountain View, and Bruce A. McKinley, Fremont, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 22, 1983, Ser. No. 535,449

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—553 **25 Claims**

1. An electrical device which comprises a

(1) a PTC element which is composed of a conductive polymer composition which exhibits PTC behavior and which comprises

(a) a cross-linked polymer component which comprises at least 15% by weight of repeating units derived from a cycloolefin, which has a crystallinity of at least 5% and which has a crystalline melting point in the range of 0° to 80° C., and

(b) a particulate conductive filler which is dispersed in said polymer; and

(2) at least two electrodes which can be connected to a source of electrical power to cause current to flow through the PTC element.

4,514,621

FIRING RANGE

Lindsay C. Knight, Albury, Australia; David A. Cash, Surrey, England; Duncan Stewart, Buckinghamshire, England; Robert A. Cottis, Berkshire, England; William H. Bowyer, Surrey, England; Robert C. Newnham, Berkshire, England; Frederick J. Williams, Bedfordshire, England, and David W. Pardon, Hertfordshire, England, assignors to Australasian Training Aids (PTY.) Limited, Albury, Australia

Continuation of Ser. No. 286,279, Jul. 23, 1981, Pat. No. 4,425,500, which is a continuation of Ser. No. 51,218, Jun. 22, 1979, Pat. No. 4,281,241, which is a continuation of Ser. No. 879,478, Feb. 21, 1978, abandoned. This application Oct. 17, 1983, Ser. No. 542,550

Claims priority, application United Kingdom, Feb. 21, 1977, 7253/77

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ F41J *5/12*; **G06F** *15/20*

U.S. Cl. 235—400 **21 Claims**

1. Apparatus for determining the location in a predetermined two-dimensional target area adjacent a target member through which the trajectory of a projectile passes, said projectile originating from a firing point and directed toward said target member, the apparatus comprising:

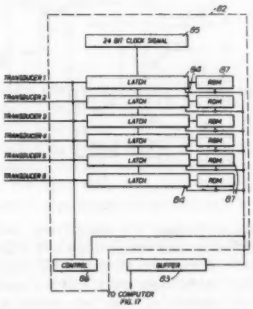
at least three transducers,

means for positioning said at least three transducers in a generally horizontal elongate array adjacent an edge of the predetermined target area,

said transducers positioned spaced apart one from the other at respective predetermined locations,

each said transducer comprising means for providing an output signal in response to an airborne pressure wave generated by the projectile,

individual threshold circuit means coupled to each transducer and responsive to said output signal for providing an indication signal when said output signal exceeds a predetermined threshold, the indication signal represent-



ing a time at which said airborne pressure wave generated by the projectile impinges on the transducer; and

processing means, provided with data representing the respective predetermined locations at which the transducers are positioned and with data representing the speed of sound propagation in air, and operative for

(1) predetermining time differences between the indication signal associated with one of said transducers relative to the indication signal associated with each of the remainder of the transducers;

(2) calculating, from data representing the respective predetermined transducer locations, the speed of sound propagation in air, and said determined time differences, the location in said predetermined target area through which said trajectory passes, and

(3) providing an indication of said calculated location.

4,514,622

METHOD AND APPARATUS FOR IDENTIFICATION OF OBJECTS

Klaus Wevelsiep, Kriftel, and Anton Kastner, Wiesbaden, both of Fed. Rep. of Germany, assignors to Scantron GmbH & Co., Frankfurt-Hoechst, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 140,936, Apr. 16, 1980, abandoned. This application Jan. 5, 1981, Ser. No. 308,713

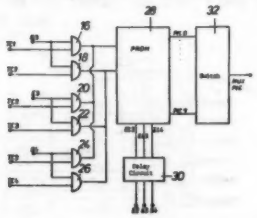
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915732; Oct. 17, 1980, 3039191

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—463 **28 Claims**

14. In an apparatus for identifying objects appearing at random positions in random orientation, and at random times on an image window and having, on a surface facing the image window, an identification in the form of an image field which includes on at least one data track contrasting indicia with at least one contrasting line pattern identifying the position and the orientation of the data track and having a plurality of parallel lines with variable spacing and/or line widths, the image window being scanned line-by-line and a binary video

signal being generated which corresponds to the scanned contrast sequence, the binary video signal including rising and falling slopes defining a first interval from one rising slope to the next rising slope and a second, successive, overlapping interval from one falling slope to the next falling slope, the image window being, in a first step, scanned under varying angles until a contrasting line pattern is detected, the position and alignment of the data field relative to the image window being determined in a second step and, in a third step, a raster scan in the direction of the data track being performed and the signals contained on the data track being read and decoded, the apparatus having an optoelectronic scanning device including a rotatable scanning raster which emits at the output the binary video signal corresponding to the image field which is scanned line-by-line and includes binarily the contrast pattern of the



scanned line, a decoder for identifying the contrasting line pattern which identifies the position and orientation of at least one data track of a data field, means for aligning the scanning raster parallel to the data track and for reading the scanned indicia of the data track, the improvement of the decoder comprising a counting circuit which receives the video signal and counts the length of successive overlapping intervals of the video signal, a two-dimensional reference table for receiving successively counted interval lengths in pairs via a gate circuit and for emitting a comparison signal having a first amplitude when the compared interval lengths have a given ratio which corresponds to the ratio of the corresponding interval of the contrasting line pattern, and an evaluation circuit for generating an identification signal during a succession of a given number of comparison signals each having the first amplitude.

4,514,623

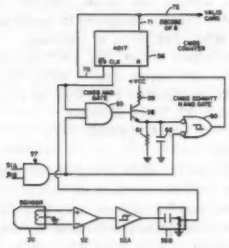
AUTOMATIC TELLER MACHINE WITH ENTRANCE ADAPTED TO PREVENT ACCESS BY FOREIGN OBJECTS

Rene Baus, Palos Verdes, and Fred W. Schmidt, Mission Viejo, both of Calif., assignors to American Magnetics Corporation, Carson, Calif.

Filed Jan. 10, 1983, Ser. No. 456,733

Int. Cl.³ G06K *13/00*

U.S. Cl. 235—482 **8 Claims**



1. An apparatus for reading information from a portable information-bearing member, said member having a first dimension and including information at a first location in fixed spatial relationship with respect to said first dimension and being adapted to generate third signals when moved with respect to a detector, said apparatus comprising:

means for receiving said information-bearing member;

a member-receiving input gate assembly, said input gate assembly comprising at least first and second spaced apart slot-defining members for defining at least first and second spaced apart slots, said first and second slots being normally mis-aligned for denying access to said means for receiving of any item introduced to said first slot;

first and second sensor arrangements disposed between said first and second slots in a manner to generate first and second signals only in the presence of an item having said first dimension and having said information at said first location;

means responsive to said first and second signals for enabling said detector to detect a preset number of said third signals; and

means responsive to said first and second signals and to the occurrence of the preset number of third signals for aligning said first and second slots in a manner to permit said item to pass to said means for receiving.

4,514,624

PHOTON DRAG DETECTORS

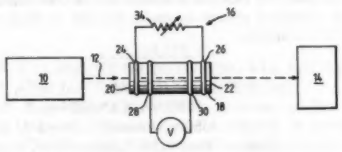
Julian G. Edwards, Weybridge, and Alan G. Roddie, Isleworth, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 17, 1982, Ser. No. 408,897

Claims priority, application United Kingdom, Aug. 19, 1981, 8125376

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—211 R **12 Claims**



1. A photon drag detector comprising:

a bar shaped block of semiconductor material with two opposite faces through one of which a beam of radiation enters and from the other of which it emerges;

spaced end electrodes in contact with said block, one adjacent to each of said opposite faces;

at least two intermediate electrodes in contact with said block, arranged intermediate and spaced from said end electrodes and spaced from each other; and

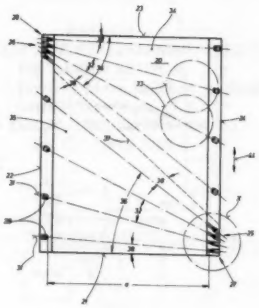
a suitable impedance connecting said end electrodes;

whereby a change in sensitivity of the detector, with the position of the beam in the said block as measured by a voltage developed between the intermediate electrodes, is made small compared with a detector not provided with said impedance.

4,514,625
ALARM SYSTEM TO SECURE A PASSAGE

Bernd Heiland, Warendorf, Fed. Rep. of Germany, assignor to (Firma) Aug. Winkhaus, Fed. Rep. of Germany

Filed Jul. 13, 1982, Ser. No. 397,810
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128073
Int. Cl.³ G08B 13/08, 13/18
U.S. Cl. 250—221 9 Claims



1. A security system for an opening such a door or window, said opening being defined to extend within a plane by a pair of linear boundary members located on opposite sides of said opening, said system comprising:

an elongated housing extending longitudinally along each of said linear boundary members, each of said housings comprising

a U-shaped profile strip adapted to be attached to said linear boundary members,

at least one longitudinally extending groove formed in said profile strip,

a cover strip attached to said profile strip,

said cover strip having therein a plurality of longitudinally spaced apart holes each separated from an adjacent hole by an intermediate web,

a filter member made of material permeable to infrared light extending essentially over the entire length of said housing covering each of said holes, and

a pluralityy of mounting plates in each of said housings slidably engagedd within said at least one groove and mounted in said housing to be independently selectively movable along said housing to selected positions;

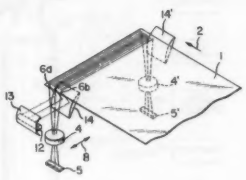
at least one infrared light transmitting unit mounted in each of said housings, each unit being diagonally offset relative to a transmitting unit in the other of said housings, each of said units including at least one infrared light transmitter with at least a plurality of said infrared light transmitters being provided in each of said housings; said plurality of infrared light transmitters being affixed to said mounting plates with each producing an infrared light beam which is limited in cross-sectional area and which is directed along a light axis extending in the plane of said opening which is offset relative to the axis of a light beam of an adjacent transmitter by an acute angle; and

at least one infrared light receiving unit provided in each of said housings, each of said units having at least one individual infrared light receiver which is affixed to said mounting plate, with said light receivers being arranged in alignment with said light transmitters in the other of said housings to receive the light beams transmitted therefrom.

4,514,626
APPARATUS FOR READING AN ORIGINAL SURFACE BY ILLUMINATING IT WITH A SLIT-LIKE BEAM

Masamichi Tateoka, Tokyo, and Yukihiko Ogata, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,722
Claims priority, application Japan, Dec. 22, 1980, 55-182465
Int. Cl.³ H01J 5/16
U.S. Cl. 250—235 8 Claims



1. An apparatus for reading an original surface by illuminating it with a slit-like light beam, comprising:

a fixed linear light source;

a cylindrical parabolic mirror fixedly provided so that the focal line position thereof is coincident with said linear light source, the light beam from said linear light source being directed in a predetermined direction by said parabolic mirror;

a cylindrical scanning mirror disposed so that the generating line direction thereof is coincident with the generating line direction of said cylindrical parabolic mirror, said cylindrical scanning mirror condensing the light beam from said cylindrical parabolic mirror in a slit-like form on the original surface and being movable in said predetermined direction along the original surface to thereby illuminate the entire area of the original surface; and

an optical system movable in said predetermined direction with said cylindrical scanning mirror to read the light beam scattered by said original surface, said optical system comprising a line sensor array and imaging optical means for directing said scattered light to said line sensor array.

4,514,627
PETROLEUM STREAM ANALYZER

Albert P. Richter, Jr., Houston; Ronald L. Campsey, Alief; Hans J. Paap, Houston, and Alfred E. Bussian, Spring, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 351,699, Feb. 24, 1982,. This application Feb. 13, 1984, Ser. No. 579,315
Int. Cl.³ G01V 5/00
U.S. Cl. 250—255 6 Claims

1. A petroleum stream analyzer comprising

a test chamber having a petroleum stream, or a portion thereof, flowing through it,

means for bombarding the petroleum stream in the test chamber with fast neutrons, which are slowed down and thereafter engaged in thermal-neutron capture reactions with materials in the petroleum stream,

means for obtaining gamma-ray energy spectra of the materials in response to the capture of the thermal-neutrons by the materials in the petroleum stream,

shielding means for shielding said obtaining means from neutrons provided by said bombarding means,

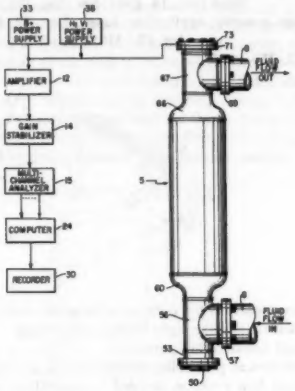
housing means for housing the bombarding means, the shielding means and the obtaining means, said housing means being located in said test chamber in a manner so that a longitudinal axis of said housing means passes through said obtaining means, shielding means and bombarding means, and is substantially aligned with the axial flow of the petroleum stream in said test chamber, and

means for deriving a measure of a characteristic of the petro-

leum stream in accordance with the obtained gamma-ray energy spectra of the materials in the petroleum stream; and

said test chamber includes

a shell,



at least two adaptor means affixed to the shell for passing the petroleum stream, or a portion thereof, into and out of the shell, and

at least two end plates affixed to opposite ends of said shell, with one end plate having the housing means attached thereto.

4,514,628

COAXIAL MINIATURE MAGNETIC SPECTROMETER

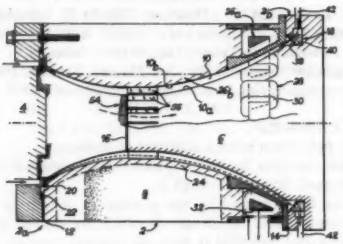
Joël Fréhaut, Bruyeres le Chatel, and Michel Roche, Dijon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 24, 1982, Ser. No. 423,071

Claims priority, application France, Oct. 9, 1981, 81 19029

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—299 **30 Claims**



1. A magnetic spectrometer, comprising a body forming a secondary circuit of a transformer for creating a magnetic field for deflecting charged particles, said body being formed by an external conductor provided with a bore and by an internal conductor in short-circuit with said external conductor, said bore and said internal conductor having a diabolo shape around a common axis, said body having two opposite ends in the direction of said axis, said two conductors defining an annular space in which the charged particles can move, said particles being injected at a first of said ends of the body, and means for detecting the deflected particles, said means being located at the second end of the body.

4,514,629

SCANNING TRANSMISSION ELECTRON MICROSCOPES

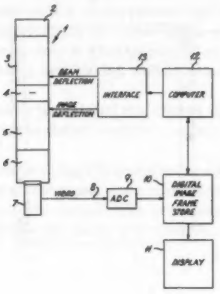
Kenneth C. A. Smith, Cambridge, England, and Stephen J. Erasmus, Mountain View, Calif., assignors to National Research Development Corporation, London, England

Filed Jun. 29, 1983, Ser. No. 509,054

Claims priority, application United Kingdom, Jul. 7, 1982, 8219647

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—311 **6 Claims**



1. A scanning transmission electron microscope including means for obtaining a video signal representing the image of a diffraction pattern derived from electron beam impingement on a point in a specimen, means for converting the video signal into digital form, a digital store for storing a plurality of digital values each representing a picture point in the said image modified by a weighting factor representing a notional pattern overlaying the screen, and means for integrating all the modified values to provide a picture value for the point of impingement of the electron beam.

4,514,630

OPTICAL SYSTEM FOR INTRUDER DETECTING DEVICE

Toshihiko Takahashi, Kyoto, Japan, assignor to Takenaka Engineering Co., Ltd., Kyoto, Japan

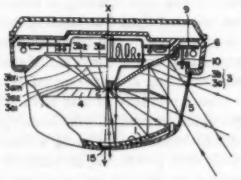
PCT No. PCT/JP81/00431, § 371 Date Sep. 14, 1982, § 102(e) Date Sep. 14, 1982, PCT Pub. No. WO82/02609, PCT Pub. Date Aug. 5, 1982

PCT Filed Dec. 28, 1981, Ser. No. 420,222

Claims priority, application Japan, Jan. 19, 1981, 56-6102[U]

Int. Cl.³ G08B *13/18*; G01J *5/08*

U.S. Cl. 250—342 **3 Claims**



1. An optical system for an intruder detector device including a parabolic mirror and an infrared detecting element positioned at the focal point of said parabolic mirror for detecting the entry of an intruder and generating an output signal in response to said entry, comprising:

a conical reflecting mirror positioned at the periphery of said infrared detecting element and facing the parabolic surface of said parabolic mirror, the visual field of said re-

flecting mirror covering said parabolic mirror up to its periphery, said reflecting mirror being an assembly comprised of a plurality of divided plane mirrors separated into an inner group and an outer group circularly displaced from said inner group; and

a convex lens disposed at the center of the parabolic mirror, and being perpendicular to the optical axis thereof, said lens having substantially the same diameter as the outer diameter of the detecting element, and focussing infrared rays from immediately below the detector device onto the activation surface of the detecting element.

4,514,631

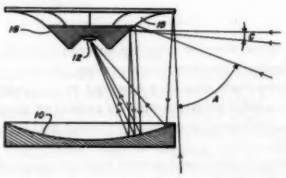
OPTICAL SYSTEM FOR CEILING MOUNTED PASSIVE INFRARED SENSOR

John K. Guscott, Lynnfield, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,852

Int. Cl.³ G01J *5/08*

U.S. Cl. 250—342 **15 Claims**



1. A ceiling mountable passive infrared intrusion system having a combination mirror assembly for detecting an intruder both when present on the floor of an area to be protected and when present between the ceiling and the floor of the area to be protected, comprising:

a first mirror having an optical axis for focusing radiation incident thereon at a point focus along its optical axis;

a mirror sub-assembly including a second mirror for providing a curtain-like first field of view that has a nominal range, a comparatively narrow azimuthal extent, and a comparatively wide elevational extent, and cooperative with the first mirror for directing the radiation present in the first field of view onto the point focus;

said mirror sub-assembly including a third mirror for providing a disc-like second field of view that is generally transverse the first field of view that has a nominal range, a comparatively narrow elevational extent, and a comparatively wide azimuthal extent, and cooperative with the first mirror for directing the radiation present in the second field of view onto the point focus; and

an infrared detector positioned at the point focus of the first mirror along the optical axis thereof and operative in response to the radiation focused thereat to provide an electrical signal representative of intruder presence.

4,514,632

MODULAR SCINTILLATION CAMERA

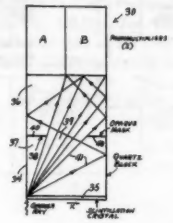
Harrison H. Barrett, Tucson, Ariz., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Nov. 24, 1981, Ser. No. 324,464

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—368 **25 Claims**

1. An imaging system for a radioactive object comprising a scintillation camera device and image forming means between said radioactive object and said camera device, said camera device comprising at least one pair of side-by-side photoelectric detection units forming an array extending in a predetermined direction, scintillation crystal means mounted to receive gamma rays from the radioactive object via said image forming means, said detection units being mounted so as to receive optical photons from scintillations in said crystal means corresponding to image coordinates of said object along said predetermined direction, and optical ray-guiding means between said photoelectric detection units and said scintillation crystal means to distribute such optical photons from a scintillation to



the respective photoelectric detection units so that the respective resultant signals generated by the photoelectric detection units vary substantially linearly with respect to said predetermined direction over a range substantially comprising the width of said array and so that said resultant signals can be utilized to computer image coordinate values over said range.

4,514,633

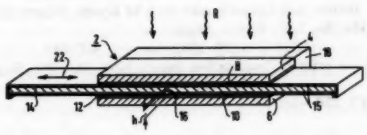
IONIZATION CHAMBER FOR MEASURING THE PROFILE OF A RADIATION FIELD OF ELECTRON OR X-RAY RADIATION

Jerry E. Chamberlain, Pittsburgh, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Nov. 17, 1983, Ser. No. 552,642

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **12 Claims**



1. An ionization chamber for measuring the profile of a radiation field, comprising:

(a) a first electrode;

(b) a second electrode arranged parallel to said first electrode, both electrodes forming a gap therebetween;

(c) a shield made of a material opaque to ions produced by the radiation field, said shield being movably arranged in said gap between said electrodes and having an aperture, said aperture between said electrodes forming a measuring volume; and

(d) means for moving said shield together with said aperture along said gap between said electrodes.

4,514,634

ELECTRON BEAM FOCUSSING

Peter J. Lawson, Cambridge, England, assignor to Cambridge Instruments Limited, Cambridge, England

Filed Mar. 1, 1983, Ser. No. 470,950

Claims priority, application United Kingdom, Mar. 2, 1982, 8206018

Int. Cl.³ G21K *1/08*; H01J *3/14, 29/58*

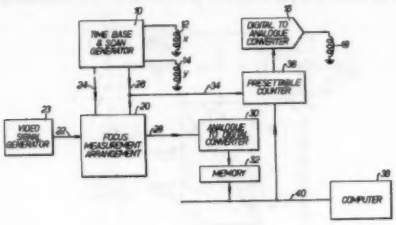
U.S. Cl. 250—397 **18 Claims**

1. A focussing method for measuring the focus of an electron beam, comprising the steps of

scanning the beam across a predetermined and sharp-edged

target for a plurality of times each at a different level of focus,

producing an output signal during each such scan in dependence on the effect on the electrons in the beam of the said target,



integrating the square of each such signal, and

comparing the values of the integrated outputs to determine the value thereof corresponding to optimum focus.

4,514,635

NON-DISPERSIVE INFRARED ANALYZER

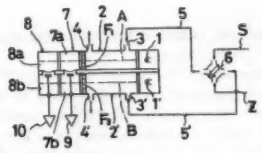
Kozo Ishida, and Takao Imaki, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 29, 1982, Ser. No. 437,885

Claims priority, application Japan, Nov. 26, 1981, 56-191331

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—343 **8 Claims**



1. A non-dispersive infrared analyzer for determining the concentration of two components, wherein a zero fluid and a sample fluid are alternately supplied to two cells and wherein two pneumatic detectors are respectively optically arranged in series with two light sources, said two cells respectively sandwiched between said two light sources and said two detectors, said pneumatic detectors respectively providing outputs corresponding to the concentration of said components whose concentration is to be determined, said analyzer comprising at least one filter whose passband corresponds to absorption bands of one of said components whose concentration is to be determined, said filter being located directly adjacent to and optically in series with at least one of said two cells; wherein said two pneumatic detectors are each provided with two light receiving chambers corresponding to two independent light passages which are arranged in series optically.

4,514,636

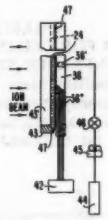
ION TREATMENT APPARATUS

Monroe L. King, Austin, Tex., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 523,908, Aug. 16, 1983, abandoned, and a continuation of Ser. No. 185,075, Sep. 8, 1980, abandoned, which is a division of Ser. No. 75,401, Sep. 14, 1979, Pat. No. 4,261,762. This application Aug. 13, 1984, Ser. No. 640,538

Int. Cl.³ G01N *21/00, 23/00*

U.S. Cl. 250—443.1 **6 Claims**



1. An apparatus for treating substantially flat wafer articles with a focused ion beam comprising:

a high vacuum chamber adapted to be evacuated to a pressure a substantial number of orders of magnitude below 1 torr, sufficient to enable formation and focusing of said ion beam,

a treating station within said high vacuum chamber,

means for producing, focusing and directing said ion beam onto wafer articles at the treating station,

a mounting member having a substantially, flat, temperature-controlled support surface on which each wafer is positioned at the treating station, and

means for controlling the temperature of the wafer comprising

an open clamping member for engageing one flat surface of said wafer at its periphery to clamp the other flat surface of said wafer against said substantially flat support surface of said mounting member,

said focused beam passing through the opening of said clamping member to said one surface of said wafer,

means for introducing, to the interface between the surface of the wafer and the surface of the mounting member, gas under subatmospheric pressure of sufficient value to enable the gas to have substantial heat conductance, said pressure being greater than about 1 torr,

whereby effective heat transfer by conduction is obtained between said surfaces of said wafer and mounting member due to the presence of said conductive gas in the short paths that exist between the urged-together surfaces while leakage of said gas into said high vacuum chamber is substantially inhibited by said clamping of said surfaces against one another, thereby to prevent said gas from influencing said treatment.

4,514,637

ATOMIC MASS MEASUREMENT SYSTEM

Jerald P. Dykstra, and Brad L. Bellamy, both of Austin, Tex., assignors to Eaton Corporation, Cleveland, Ohio

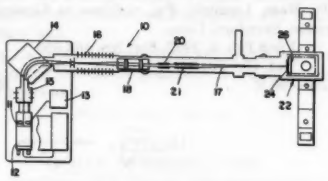
Filed Feb. 24, 1983, Ser. No. 469,184

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—492.2 **5 Claims**

1. In an ion implanter including an extraction power supply, an ion source, an analyzing magnet operable to select certain ion species emanating from the source for implantation, a rotation coil for generating a first electrical signal proportional to the magnetic field of the analyzing magnet, means for generating a second electrical signal proportional to the beam energy at the analyzing magnet, calculating means performing calculations on the first and second signals to determine the

atomic mass of the selected ion species, and indicating means for providing a visual display of said atomic mass, the improvement wherein: said rotating coil is driven by a synchronous motor powered by A.C. line voltage; and including means converting said first electrical signal to a first frequency signal,



and means for counting said first frequency signal over a time corresponding to the period of the line frequency to provide a first digital count to said calculating means which is proportional to the magnetic field of said analyzing magnet independent of the line frequency.

4,514,638

ELECTRON-OPTICAL SYSTEM WITH VARIABLE-SHAPED BEAM FOR GENERATING AND MEASURING MICROSTRUCTURES

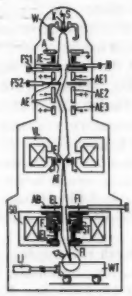
Burkhard Lischke, Munich; Juergen Frosien, Ottobrunn; Klaus Anger, and Erich Plies, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 398,559, Jul. 15, 1982,. This application Aug. 22, 1984, Ser. No. 643,108

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138896

Int. Cl.³ H01J *37/145, 37/30*

U.S. Cl. 250—492.2 **17 Claims**



1. An electron-optical system with a variable-shaped beam for generating and measuring microstructures at a beam target comprising in succession in the direction of beam travel:

an electron source for generating an electron beam;

a first lens means for focusing said electron beam which is a remote focus multipole Wehnelt electrode disposed adjacent to said electron source;

at least one slot diaphragm for shaping the cross-section of said electron beam;

a second lens means for generating an image of the shaped beam cross-section onto an intermediate image plane; and

a third lens means for projecting said intermediate image of said shaped beam cross-section onto said target

said first, second and third lens means and said slot diaphragm operating in combination as a shadow projection imaging means for generating said variable-shaped beam and said electron-optical system having no more that three lenses between said electron source and said target location.

4,514,639

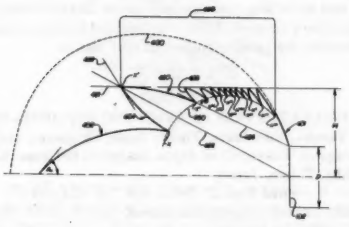
BLACKBODY SIMULATOR WITH UNIFORM EMISSIVITY

Frederick O. Bartell, 2636 W. Calle Puebla, Tucson, Ariz. 85745

Continuation of Ser. No. 340,808, Jan. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 163,305, Jun. 26, 1980, Pat. No. 4,317,042. This application Jun. 7, 1983, Ser. No. 502,004

Int. Cl.³ G21G *4/00*

U.S. Cl. 250—493.1 **44 Claims**



1. A blackbody simulator, comprising:

a core with a first side;

the core having an aperture on its first side to a cavity, the cavity being rotationally symmetrical about an axis and having a cone-like apex on the axis opposite the aperture with an apex half-angle of less that 60°; the cavity surface being shaped so that the value of the projected solid angle of the aperture with respect to any point on the cavity surface is generally constant;

the cavity having n subsurfaces with the n^{th} subsurface having the shape of a portion of a sphere;

the cavity subsurfaces defining inner and outer limiting curves with each subsurface up to the $(n-1)^{th}$ subsurface arcuately extending from the inner limiting curve to the outer limiting curve;

said outer limiting curve remaining inside the sphere defined by the n^{th} subsurface and the inner limiting curve remaining outside an arch defined by the locations at which a tangent in a plane containing the axis of symmetry intersects the rim of the aperture for each subsurface if extended to the arch.

4,514,640

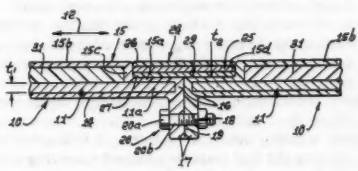
RADIATION SHIELDING STRUCTURES

Michael J. Bagnell, 688 Flaming Star Ave., Thousand Oaks, Calif. 91360, and William R. Ivy, 1908 Singingwood Ave., Pomona, Calif. 91767

Filed Sep. 28, 1982, Ser. No. 425,724

Int. Cl.³ G21F *3/04*

U.S. Cl. 250—517.1 **9 Claims**



1. A radiation shielding structural component, comprising in combination

(a) two longitudinally elongated bodies each having L-

shaped cross-section in lateral planes normal to the longitudinal direction,

(b) each body including a panel shaped core consisting of radiation shielding material, and glass fiber layers surrounding said core and attached thereto in covering relation therewith,

(c) each body including a filler sheet extending in sandwiched relation to the core and the glass fiber layers, and generally parallel to the core,

(d) said bodies forming a recess located edgewise between said filler sheets and overlapping portions of the cores closest to said flanges, the recess adapted to receive an auxiliary panel that incorporates an auxiliary core consisting of radiation shielding material, and glass fiber layers at opposite sides of said auxiliary core,

(e) and including said auxiliary panel in said recess and the auxiliary core of which overlaps said core portions of said bodies, the panel attached to said bodies.

4,514,641

APPARATUS FOR RETRIEVING INFORMATION

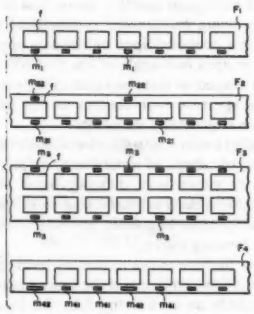
Kano Tanaka, Yokohama; Yoshio Ando, Chigasaki, and Hitoshi Yanagawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,635

Claims priority, application Japan, Nov. 9, 1981, 56-179429; Nov. 9, 1981, 56-179430

Int. Cl.³ G06K *7/10*

U.S. Cl. 250—570 **4 Claims**



1. A retrieving apparatus for retrieving a desired image in a selected film by selecting a film having a first mark on the images or a film having at least two marks including the first mark and a second mark selectively applied to the images, said apparatus comprising:

mark detection means for detecting said first mark or said second mark and, when the first mark is detected, for outputting a first mark signal and, when the second mark is detected, for outputting a second mark signal;

counting means having a first counting part for counting said first mark signals output from said mark detention means and a second counting part for counting said second mark signals output from said mark detection means;

control means for controlling the feeding of the film by comparing the retrieving number of the desired image and counting value of the first counting part or the second counting part;

signal generation means for generating a signal corresponding to the film to be used;

mode selecting means for selecting a first retrieving mode utilizing the first mark or a second retrieving mode utilizing the second mark; and

display means for indicating the possibility of retrieval under the selected retrieving mode using the selected film on the basis of the signal output from said signal generation means and the signal output from said mode selecting means.

4,514,642

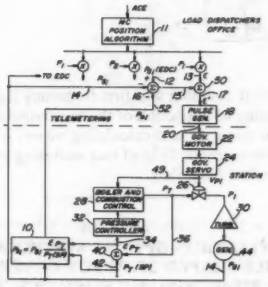
UNIT CONTROLLER FOR MULTIPLE-UNIT DISPATCH CONTROL

Charles W. Ross, Lansdale, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 4, 1983, Ser. No. 463,690

Int. Cl.³ F01D *17/04;* F01K *13/00*

U.S. Cl. 290—40 R **10 Claims**



1. In a control system for distributing the regulating burden of a power system among a plurality of generators when said plurality of generators includes both fast and slow responding units and control of the regulation is carried out with an integrating unit control having an integrating element responding to a unit error signal which represents a predetermined part of the area control error, the improvement in each of the unit controls for the slow responding unit comprising:

means responsive to a variable of the power system at the unit level for producing an anticipatory feedback signal indicative of the change in generation of the unit that will occur when the unit has responded fully to the integrating control to reduce the unit error signal toward zero; and

means for introducing said anticipatory signal into the control system on the input side of the integrating element to provide the anticipatory response required to prevent improper control action.

4,514,643

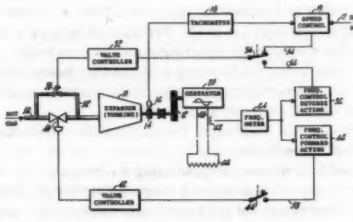
PARALLEL VALVE ROTARY MACHINE CONTROL SYSTEM

Edward J. Condrac, North Huntingdon, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed May 11, 1984, Ser. No. 609,903

Int. Cl.³ F01D *17/02*

U.S. Cl. 290—40 C **11 Claims**



1. A method of controlling a turbine generator set powered by a fluid flowing to the turbine which comprises the steps of:

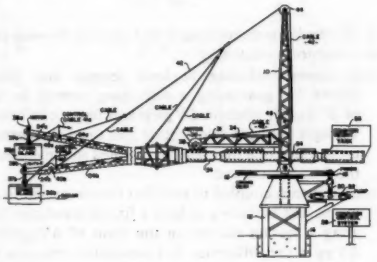
controlling a portion of the fluid flow to the turbine with a first valve having a relatively slow gate movement speed;
regulating a portion of the fluid flow to the turbine with a second valve having a relatively fast gate movement speed;
sensing a condition of the generator portion of the turbine generator set and generating a signal in response to a variance between the sensed condition and a reference condition; and
actuating the steps of controlling and regulating to vary a condition of the motor generator set in response to the signal generated.

4,514,644

OCEAN POWERED PUMP

Wayne A. Westling, 1530 21st St., Manhattan Beach, Calif. 90266

Filed Aug. 12, 1983, Ser. No. 522,506
Int. Cl.³ F03B *13/12*
U.S. Cl. 290—53 **2 Claims**



1. A wave motor comprising:
(a) a first member mounted for rotation;
(b) a generally horizontal boom adapted to rotate about a vertical axis, driving said first member;
(c) a blade means attached to said boom at an end remote from said first member, said blade means movably attached to said boom so as to controllably be extended into a wave affected body of water or be raised from it without moving said boom;
(d) means to extend said blade into said water at a first predetermined location of the boom relative to said body of water to effect a wave driven motion of the boom;
(e) means to raise said blade out of said water after said wave driven motion at a second predetermined location of the boom relative to said body of water; and
(f) means to return said boom to its first predetermined location.

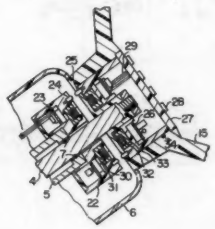
4,514,645

POWER SUPPLY SYSTEM FOR AUTOMOTIVE PARTS HAVING A ROTARY COMPONENT

Akira Endo, Mito; Akira Hasegawa, Katsuta, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,802
Claims priority, application Japan, Feb. 19, 1982, 57-24482
Int. Cl.³ H02G *3/00*
U.S. Cl. 307—10 R **10 Claims**

1. A system for supplying electric power to automotive parts having a rotary component and a stationary component, the system comprising:
a first coil fixed on the stationary component;
a second coil fixed on the rotary component in opposition to said first coil;
means for supplying an AC voltage to said first coil;
means for rectifying the AC voltage induced in said second coil into a DC voltage;
signal generating means connected to said means for rectifying;
first spatial transmission means for transmitting a signal generated by said signal generating means from said rotary component to said stationary component, said first spatial transmission means being connected to said signal generating means;



second spatial transmission means for receiving a signal transmitted by said first transmission means, said second spatial transmission means being fixed on said stationary component; and
means for intensifying an excitation of said first coil for a predetermined length of time immediately following the generation of said signal and weakening said excitation for the remaining time, said means for intensifying being connected between said second spatial transmission means and said first coil, whereby said electric power is changed for said predetermined length of time.

4,514,646

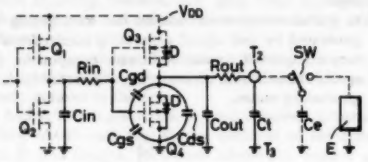
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING A PROTECTIVE RESISTOR ARRANGEMENT FOR OUTPUT TRANSISTORS

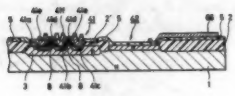
Yoshibumi Ando, Kodaira; Takashi Sakamoto, Tachikawa; Kanji Yoh, Mitaka; Hisahiro Moriuchi, Koganei, and Sumiaki Takei, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,653
Claims priority, application Japan, Aug. 20, 1980, 55-113518
Int. Cl.³ H03K *17/08;* **H02H** *3/20*
U.S. Cl. 307—200 B **12 Claims**

1. A semiconductor integrated circuit device comprising:
a semiconductor substrate;
an external terminal formed on said semiconductor substrate from which external terminal an output signal from said integrated circuit device can be derived from outside said semiconductor substrate;
an output circuit for receiving a drive signal and for delivering said output signal to said external terminal, said output circuit including an insulated gate field effect transistor formed in said semiconductor substrate and having a first output electrode, a second output electrode coupled to said external terminal, and a gate electrode;
a drive circuit for generating at an output terminal thereof said drive signal to be fed to said gate electrode of said insulated gate field effect transistor, said drive circuit being formed in said semiconductor substrate;
first resistor means having one end coupled to said output terminal of said drive circuit, said first resistor means being formed on an insulating film on said semiconductor substrate such that PN junctions are not formed at said first resistor means; and
connecting means for connecting another end of said first resistor means with said gate electrode of said insulated

gate field effect transistor, said connecting means being formed on an insulating film on said semiconductor sub-





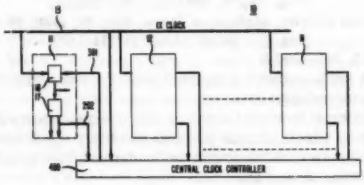
strate such that PN junctions are not formed at said connecting means.

4,514,647

CHIPSET SYNCHRONIZATION ARRANGEMENT

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 1, 1983, Ser. No. 519,495
Int. Cl.³ H03K *5/135, 5/14, 5/12, 3/86*
U.S. Cl. 307—269 **9 Claims**



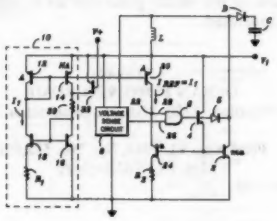
1. A circuit arrangement for synchronizing clock pulses in a chipset, said chipset comprising at least first and second integrated circuit chips in each of which a plurality of components is defined, each of said chips including an arrangement of adjustable delay circuits for providing internal clock pulses in response to a system clock signal and including control means for adjusting the delay of said internal clock pulses in response to a control signal, said circuit arrangement comprising at least first control signal generating circuits for generating individual control signals for said first and second chips respectively, each of said control signal generating circuits being responsive to said system clock signal and one of said internal clock pulses from an associated one of said first and second chips for adjusting the delay of said internal clock pulses during a next clock cycle.

4,514,648

CURRENT SENSE CIRCUIT FOR A BUBBLE MEMORY VOLTAGE BOOSTER

Robert N. Dotson, Mesa; Robert B. Davies, and Ira Miller, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1982, Ser. No. 412,057
Int. Cl.³ H03K *5/153, 5/24, 17/08*
U.S. Cl. 307—350 **6 Claims**



1. A circuit for monitoring a first current flowing through a first transistor, comprising:

first means including at least second and third transistors for generating a reference current in the form of $\Delta V_{BE}/R_1$ wherein ΔV_{BE} is a difference in base-emitter voltages between said second and third transistor and R_1 is the value of a first resistor coupled to the emitter of said third transistor; and

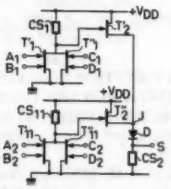
second means coupled to said first transistor and to said first means and including at least a fourth transistor for generating a second current in the form of $\Delta V_{BE}/R_2$ where ΔV_{BE} is the difference in base-emitter voltages between said fourth transistor and said first transistor and R_2 is the value of a second resistor coupled to the emitter of said fourth transistor, which second current is representative of said first current.

4,514,649

HIGH-ENTRANCE HIGH-SPEED LOGIC OPERATOR WHICH HAS A COMPLEX DIGITAL FUNCTION AND UTILIZES AT LEAST ONE QUASI-NORMALLY OFF MESFET

Gérard Nuzillat, and Georges Bert, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 21, 1981, Ser. No. 265,918
Claims priority, application France, May 23, 1980, 80 11550
Int. Cl.³ H03K *19/017, 19/094, 19/20*
U.S. Cl. 307—450 **4 Claims**



3. A multiple-input high-speed logic operator which performs a plurality of logic functions and which is supplied by a single source of voltage, comprising:

a plurality of input branches with each input branch including a saturable resistive load in series with the parallel connection of a pair of quasi-normally-off MESFET's, with each of said MESFET's having a maximum of two schottky gates, with said MESFET's being connected in

parallel; and wherein each input branch including an output node at the connection of the resistive load to the parallel-connected MESFET's; and

a common output half-branch, operatively connected to said plurality of output nodes, including a diode in series with a second saturable resistive load.

4,514,650

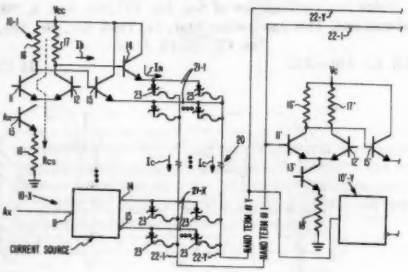
LOW POWER SMALL AREA PLA

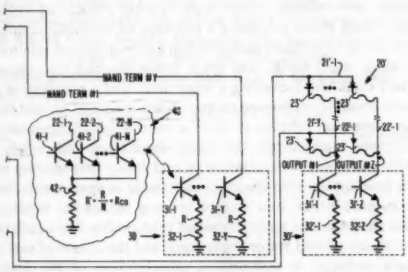
Daniel Yum, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 25, 1982, Ser. No. 436,421

Int. Cl.³ H03K *19/177, 19/086*

U.S. Cl. 307—466 **12 Claims**





1. A logic array including multiple gated current source means for receiving logic input signals, each of said gated current source means being coupled to a respective pair of row conductors and including means for gating current exclusively to one row conductor or the other of said pair to indicate the state of the received input signal, column conductors which are coupled to selectively received current from any of said row conductors, means for generating respective NAND signals coupled to said column conductors indicating when current is received by each of said column conductors; additional gated current source means respectively coupled to receive said NAND signals and send current respectively to additional row conductors when the NAND signals are in predetermined states, additional column conductors coupled to selectively receive current from said additional row conductors, and output means coupled to said additional column conductors for generating respective output NAND signals indicating when current is received therefrom; the number of said additional gated current source means that receive said NAND signals being Y, the number of said output means that generate said output NAND signals being Z, and the total number of transistors and diodes therein plus said coupling therebetween being no more than $4Y+Z$ and YZ respectively where Y and Z are integers.

4,514,651

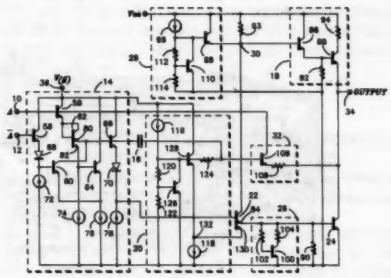
ECL TO TTL OUTPUT STAGE

Ira Miller, Tempe, and Michael W. Null, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1982, Ser. No. 450,415

Int. Cl.³ H03K *19/092, 19/088, 19/086*

U.S. Cl. 307—475 **9 Claims**



1. A level shifting circuit for receiving first and second input signals each capable of assuming logical high and logical low ECL voltage levels and for generating therefrom an output capable of assuming logical high and logical low TTL voltage levels, comprising:

a first level shifting transistor responsive to said first input signal;

a second level shifting transistor responsive to said first level shifting transistor for producing a drive current;

a third level shifting transistor responsive to said first drive current for rendering said third level shifting transistor conductive;

a level shifting diode having an anode for receiving current from said third level shifting transistor and having a cathode;

a push-pull output stage including source transistor means and sink transistor means for producing said output;

a drive transistor responsive to current at said cathode for rendering said sink transistor means conductive and said source transistor means nonconductive; and

first means responsive to said second input signal for diverting said first drive current so as to render said third level shifting transistor less conductive and said drive transistor nonconductive which in turn renders said source transistor means conductive and said sink transistor means nonconductive.

4,514,652

LIQUID COOLED HIGH SPEED SYNCHRONOUS MACHINE

Raymond N. Olson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 13, 1983, Ser. No. 513,333

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—54 **10 Claims**

1. In a rotary electric machine, the combination of:

a housing;

a stator within said housing and including an armature provided with windings and a rotor receiving opening;

a rotor journalled within said housing and located within said opening and peripherally spaced from said armature by a first air gap, said rotor carrying windings and having an interior cavity;

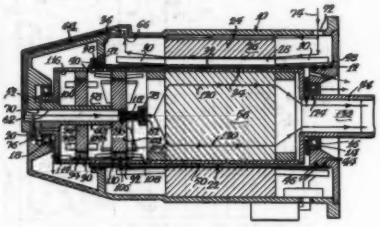
a stationary element affixed to said housing and extending axially into said cavity;

rotor windings energizing means including at least one winding and associated armature carried by said rotor within said cavity and radially outwardly of said stationary ele-

ment and cooperating magnet means mounted on said stationary element within said cavity for generating electrical current for said rotor windings, said rotor windings energizing armature and said magnet means being separated by a second air gap;

first coolant passages in heat exchange relation to said stator windings;

second coolant passages in heat exchange relation to said rotor windings;



barrier means in said first air gap adjacent said stator for providing fluid flow isolation between said stator and said first air gap;

means for providing a liquid coolant to (a) said stator including said first passages, (b) to said rotor cavity including said second passages and said rotor winding energizing means; and

means on said rotor for preventing coolant from entering said second air gap during operation of said machine.

4,514,653

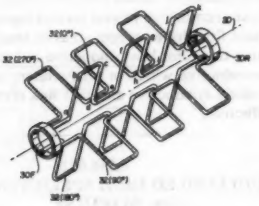
COMMUTATORLESS DIRECT CURRENT MACHINE

Prahlada R. Batni, 700 Butternut St., Washington, D.C. 20012

Continuation-in-part of Ser. No. 370,133, Apr. 20, 1982, abandoned. This application Mar. 27, 1984, Ser. No. 593,199

Int. Cl.³ H02K *31/00*

U.S. Cl. 310—178 **19 Claims**



1. A commutatorless DC machine having an outer housing and a shaft for rotation therein, comprising:

(a) a plurality of axially spaced annular stator disks of magnetic material mounted within said housing;

(b) at least one axially spaced annular rotor disk of magnetic material arranged concentrically along said shaft for rotation therewith;

(c) each of said at least one rotor disk positioned adjacent to at least one stator disk and interleaved therewith to establish axial air gaps between the adjacent surfaces of said interleaved disks;

(d) a plurality of radially disposed electrical conductors affixed to each of said at least one rotor disk so as to be rotatable in said air gaps, and serially interconnected via a serpentine path into a unitary armature winding element having two ends wherein said unitary armature winding element is confined to a portion of a radial plane containing the axis of rotation of the shaft and bounded on one edge by said axis;

(e) each of said ends connected to one of a pair of slip rings mounted on said shaft; and

(f) whereby two of the group consisting of said unitary armature winding element, and said axial air gaps, and said rotatable shaft, may be so energized as to produce electromechanical transducer action.

4,514,654

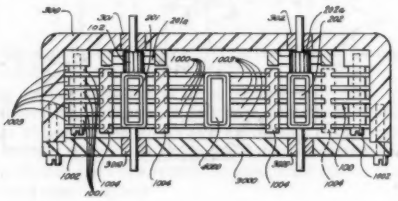
SMALL SIZE ELECTRIC MOTOR

Rolf Müller, Deargen, Fed. Rep. of Germany, assignor to Papst Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 440,026, Nov. 8, 1982, abandoned, which is a continuation of Ser. No. 137,988, Apr. 4, 1980, abandoned. This application Mar. 14, 1984, Ser. No. 589,841

Int. Cl.³ H02K *3/48*

U.S. Cl. 310—216 **16 Claims**



1. An electric motor, comprising a stator; at least one wound rotor; commutator means with brushes associated with said rotor; said stator including a plurality of magnetic conductors formed of iron sheets assembled in a superimposed relation into a stator sheet stack, said rotor being inserted into the stator sheet stack and including a rotor shaft and a plurality of magnetic conductors formed of iron sheets mounted on said shaft in superimposed relation to form a rotor sheet stack; permanent magnets, inserted into the stator sheet stack and cooperating with said rotor for excitation of said rotor; first spacing means for holding the iron sheets in said stator in spaced relationship from each other, and second spacing means for holding the iron sheets in said rotor in spaced relationship from each other, the sheets of said stator sheet stack and the sheets of said rotor stack defining in assembly a cross-section of the magnetic conductors, the sheets in the stator sheet stack and the sheets in the rotor sheet stack in assembly being spaced from one another by layers of reduced conductivity extended between the respective spacing means so that said cross-section is reduced causing the reduction of the moment of axial inertia of the electric motor.

4,514,655

COMPACT CAPACITOR MOTOR WITH THIN COIL CORES

Toshiro Hosoya, Tokyo, Japan, assignor to Tobishi Industries Ltd., Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,788

Int. Cl.³ H02K *15/02, 15/04*

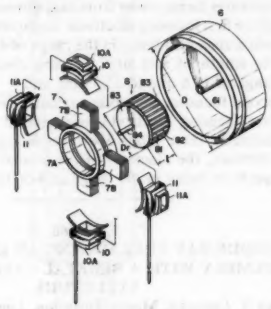
U.S. Cl. 310—218 **3 Claims**

1. A small capacitor motor comprising a rotor, a stator core disposed in concentric relationship with the rotor and stator coils wound on the stator core, wherein said stator core comprises:

a ring-shaped core part surrounding the core of the rotor and having an axial thickness substantially equal to the axial thickness of the core of the rotor and a plurality of coil winding core parts, each radially extending from the periphery of the ring-shaped core part and having an axial thickness less than the axial thickness of the ring-shaped

core part and on which coil winding core parts the stator coils are to be mounted;

said stator core comprising two back to back identically shaped core plates, each having a plurality of radial parts



constituting one half of said plurality of coil winding core parts and a projecting ring part projecting from the inner ends of said radial parts to one side in a direction perpendicular to the radial direction and constituting one half of said ring-shaped core parts.

4,514,656

COMBINATION SPARKPLUG AND COMBUSTION PROCESS SENSOR

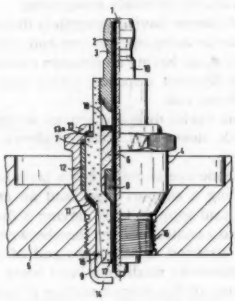
Eckart Damson, Stuttgart; Reinhard Latsch, Vaihingen; Ernst Linder, Mühlacker; Franz Rieger, Aalen, and Rainer Schüssler, Bietigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 428,003

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147291

Int. Cl.³ H01T *1/12, 13/16, 13/48*

U.S. Cl. 313—11.5 **18 Claims**



1. Combination sparkplug and combustion process sensor with a selected heat transfer characteristic, having

a metallic housing (4) including means (15) for securing the housing in an engine block (5) of an internal combustion engine;

an insulating body (7) secured in the housing, and formed with a central opening;

a glass rod (1) forming a light guide, centrally extending through the opening in the insulating body;

metallic means (3,8,10), at least in part surrounding the glass rod, to carry electrical ignition energy through the insulating body;

and comprising, in accordance with the invention,

means for matching the heat transfer characteristic of said combination to operating requirements of said engine by controlling heat transfer between the metal means, the glass rod (1), the insulating body (7) and the housing (4) including

a heat conductive mass (2) located between the glass rod (1) and the metal means (3,8,10) and extending therebetween through a predetermined controlled distance along the length of the glass rod and the metal means; and

at least one electrically conductive heat transfer element (6,19,20,21) located between said metallic means (3,8,10) and said insulating body (7) to provide heat conduction therebetween.

4,514,657

SPARK PLUG HAVING DUAL GAPS FOR INTERNAL COMBUSTION ENGINES

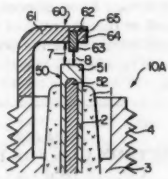
Toshihiko Igashira, Toyokawa, and Toru Yoshinaga, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 24, 1981, Ser. No. 257,135

Claims priority, application Japan, Apr. 28, 1980, 55-56920; Jul. 3, 1980, 55-91448; Nov. 11, 1980, 55-158957; Nov. 11, 1980, 55-158958; Nov. 25, 1980, 55-165460; Dec. 1, 1980, 55-169399

Int. Cl.³ H01T *13/20, 13/32*

U.S. Cl. 313—130 **13 Claims**



1. In a spark plug for spark ignition type internal combustion engines, including an earth electrode formed of a heat-resisting and electrically conductive material and a central electrode, the improvement comprising: a supplementary electrode electrically connected to one of said earth and central electrodes, the tip end of said supplementary electrode extending in facing relationship with the other of said earth and central electrodes, at least the surface portion of said supplementary electrode being formed of an electrically conductive ceramic having a specific resistance in the range of 10^{-3} Ω.cm to 10^{6} Ω.cm, the tip end of said supplementary electrode cooperating with said other electrode to define therebetween a gap of smaller dimension than that of the gap between said earth and central electrodes.

4,514,658

MESH LENS FOCUS MASK FOR A CATHODE-RAY TUBE

Stanley Bloom, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 31, 1983, Ser. No. 480,762

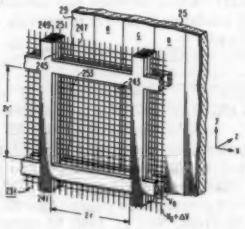
Int. Cl.³ H01J *29/07*

U.S. Cl. 313—402 **17 Claims**

1. In a cathode-ray tube having a target comprising an array of phosphor elements of different emission colors arranged in cyclic order in adjacent color groups, each group including an element of each of said different emission colors, means for producing a plurality of electron beams directed toward said target, and a color selection structure positioned between said target and said beam producing means, said color-selection structure producing a plurality of lenses for passing and focusing portions of electron beams to associated color groups of said target, the improvement wherein

said color-selection structure includes a first electrode having at least one lenticular member, a second electrode

having two opposed major surfaces, one of said surfaces being insulatingly spaced from said first electrode by a longitudinal distance, s, said second electrode comprises a conductive mesh having interstitial dimensions small compared to said phosphor elements, and a third electrode having at least one lenticular member, said third electrode being spaced a longitudinal distance, s, from the other major surface of said conductive mesh, said lenticular



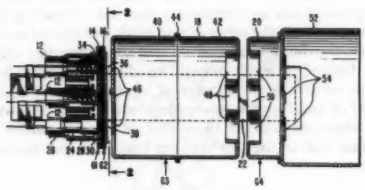
member of said first electrode having therein an array of windows associated with only one color group, each window having a half-width, r, said lenticular member of said first electrode being disposed proximate to said conductive mesh so that the ratio of the longitudinal spacing, s, to the half-width, r, of the window is much less than unity ($s/r << 1$), whereby said electrodes provide a strong lens action.

4,514,659

INLINE ELECTRON GUN FOR HIGH RESOLUTION COLOR DISPLAY TUBE

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 4, 1982, Ser. No. 354,655
Int. Cl.³ H01J *29/50, 29/56*
U.S. Cl. 313—412 **4 Claims**



1. An inline electron gun for producing three inline electron beams each having an electron beam current of approximately 200 microamps for use in a high resolution color display tube, comprising

three inline cathode assemblies,

a control grid adjacent to said cathode assemblies, said control grid including three inline apertures aligned with said cathode assemblies, the diameters of the control grid apertures being in the range of 0.43 mm to 0.59 mm,

a screen grid spaced from 0.13 mm to 0.26 mm from said control grid, said screen grid including three inline apertures aligned with the control grid apertures, the diameters of the control grid apertures being in the range of 0.43 mm to 0.56 mm, the thickness of said screen grid at the aperatures being in the range of 0.20 mm to 0.31 mm, said screen grid including a slot at each screen grid aperture longitudinally extending in the inline direction of the three inline screen grid apertures, each slot being on a side of the screen grid facing away from the control grid, the ratio of the depth of the slot to the width of the slot being in the range of 0.13 to 0.23,

a first focusing electrode adjacent to an spaced from said screen grid, said first focusing electrode including three inline apertures fcing said screen grid and three inline apertures facing away from said screen grid, the diameters of the first focusing electrode aperatures facing away from said screen grid being in the range of 4.06 mm to 5.44 mm, the length of said first focusing electrode being in the range of 17.6 mm to 23.5 mm, and

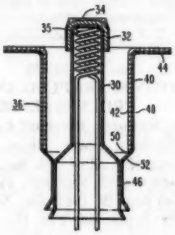
a second focusing electrode adjcent to and spaced from said first focusing electrode, said second focusing electrode including three inline apertures facing said first focusing electrode, the diameter of the second focusing electrode apertures being in the range of 4.06 mm to 5.44 mm.

4,514,660

CATHODE-RAY TUBE HAVING AN ELECTRON GUN ASSEMBLY WITH A BIMETAL CATHODE EYELET STRUCTURE

Stephen T. Opresko, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1983, Ser. No. 556,185
Int. Cl.³ H01J *29/06, 29/46, 9/02*
U.S. Cl. 313—446 **7 Claims**



1. In a cathode-ray tube having an electron gun including at least one cathode assembly comprising

a cathode sleeve having oppositely disposed ends, said cathode sleeve being open at one end and closed at the other end by a cap having an electron emitting coating thereon,

a heater filament disposed within said sleeve and spaced therefrom, and

a cathode eyelet disposed around at least a portion of said cathode sleeve and attached thereto, the improvement wherein

said cathode eyelet comprises a laminated bimetal member including a support layer and an emissivity modifying layer, said support layer having a distal end, a proximal end and a central portion therebetween, said proximal end being attached to said open end of said cathode sleeve, said emissivity modifying layer being disposed on at least a portion of the interior surface of said central portion of said support layer, said emissivity modifying layer being spaced from said proximal end of said support layer.

4,514,661

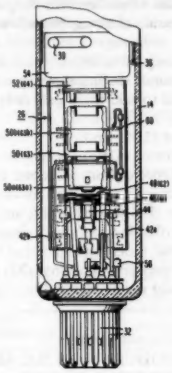
ARC-SUPPRESSION MEANS FOR AN ELECTRON GUN HAVING A SPLIT ELECTRODE

Robert P. Stone, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,136
Int. Cl.³ H01J *29/96*
U.S. Cl. 315—3 **4 Claims**

1. In an electron gun with at least one cathode for generating an electron beam along a beam path and a plurality of electrodes serially disposed along the beam path, at least one accelerating and focusing electrode having two spaced-apart elec-

trode sections adjacent to one another and axially separated along a plane substantially perpendicular to the beam path, wherein the improvement comprises



an arc suppression resistor interconnecting the spaced-apart electrode sections of said electrode, said interconnected electrode sections normally operating at substantially the same voltage, said resistor acting in the event of an arc to limit the arc current.

4,514,662

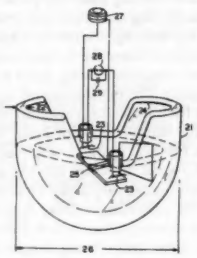
MAGNETIC ARC SPREADING FLUORESCENT LAMPS

S. Merrill Skeist, 1620 Cedar Swamp Rd., Brookville Glen Head, N.Y. 11545, and Leo Gross, 3611 217 St., Bayside, N.Y. 11361

Continuation of Ser. No. 45,589, Jun. 4, 1979, and a continuation of Ser. No. 93,053, Nov. 13, 1979. This application Feb. 17, 1981, Ser. No. 235,306

Int. Cl.³ H01J *7/44, 13/46, 19/78, 29/96;* **H01K** *1/62*

U.S. Cl. 315—57 **12 Claims**



1. An improved magnetic arc spreading device, such as a fluorescent lamp, comprising a double walled hemispherical lamp envelope without any interior partitions of any kind and forming a hemispherical shell volume for an arc discharge, electrode means for forming said arc discharge in said envelope, a luminescent phosphor coating on all interior walls of said envelope, a circuitry means mounted on and within said envelope and a screw base secured to at least a part of said envelope, and magnetic arcs spreading coil means diffusing, deflecting and spreading said arc discharged throughout the entire volume of said envelope; and magnetic arc spreading coil means comprising a solenoid which is at least a part of the ballast for said arc discharge device; and said coil means being connected in series with said electrode means of said envelope with the other end of said coil means being wired to said screw base; whereby greater light output is achieved due to the hemispherical shell volume in the envelope construction which provides considerable more phosphor surface area.

4,514,663

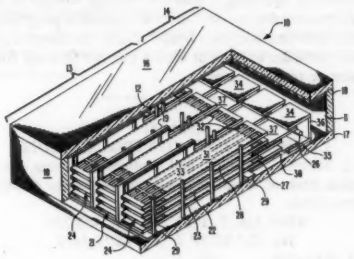
ELECTRON BEAM INJECTION STRUCTURE FOR FLAT PANEL DISPLAY DEVICES

Leon J. Vieland, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 29, 1983, Ser. No. 489,800

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—366 **4 Claims**



1. In a flat panel display device having a display screen and an evacuated envelope divided into a plurality of channels, said channels including an electron gun section, and an electron beam guide section, said electron gun section including cathode means for providing electrons and means for modulating said electrons, said electron guide section including spaced substantially parallel rectangular beam guides for receiving and focusing said electrons into beams in the space between said guides, said beam guides having a plurality of apertures arranged in columns longitudinally along said channels, an improvement comprising:

electron injection means arranged between said cathode means and said electron guide section for injecting electrons to said guide section from said cathode means; said electron injection means including spaced substantially parallel rectangular injection electrodes, one end of said injection electrodes being arranged in the proximity of said cathode, and the other end of said injection electrodes being arranged on opposite sides of said electron guide section whereby a portion of said electron guide section is between a portion of said injection electrodes.

4,514,664

COLOR TELEVISION RECEIVER

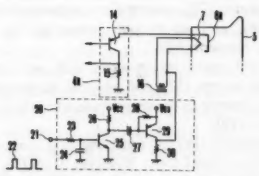
Kunisuke Kasagi, and Machio Kawashima, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,662

Claims priority, application Japan, May 13, 1981, 56-70718

Int. Cl.³ H01J *29/52;* **H04N** *9/535*

U.S. Cl. 315—383 **3 Claims**



1. A color television receiver comprising:

a color picture tube having electron guns including cathodes and heaters therefor, respectively;

an automatic cutoff adjusting circuit for adding a reference voltage signal substantially at a black level to a luminance signal during an interval beginning substantially at the end of a vertical blanking period and ending prior to the video portion of the vertical deflection period, and for detecting cathode currents flowing toward said cathodes during said interval to control cathode voltages applied to said cathode for keeping said cathode currents at a predetermined level by way of feedback of voltages proportional to said cathode current; and

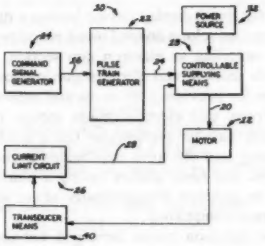
a circuit for applying a positive biasing voltage to each of said heaters during said interval to allow a potential difference between said each heater and a corresponding one of said cathodes to limit at least a current flowing from said cathode to said heater.

4,514,665

CURRENT LIMIT CONTROL CIRCUIT

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 5, 1983, Ser. No. 455,720
Int. Cl.³ H02P 1/00; H02H 3/24
U.S. Cl. 318—139 **1 Claim**



1. Apparatus (10) for controllably energizing a motor (12), comprising:

a DC electric power source (32) controllably connected to said motor (12);

generating means (14) for producing a predetermined plurality of incremental coded digital motor speed command signals;

first means (22) for receiving said digital motor speed command signals and producing respective predetermined pulse trains in response to each of said received command signals, each of said pulse trains having a predetermined duty factor;

controllable supplying means (18) for receiving said pulse trains and delivering electric current from said power source (32) to said motor (12), said controllable supplying means (18) including a power switching element (88) connected between said power source (32) and said motor (12), and a logic gate (84) having a first input connected to said first means (22), a second input connected to a second means (26), and an output connected to said power switching element (88);

a current shunt connected in series with said motor (12) and said power source (32), and adapted to produce a current signal in response to the magnitude of current delivered to said motor (12);

said second means (26) for receiving said current signal and producing a digital logic blocking signal in response to said current signal exceeding a predetermined magnitude, said second means (22) including a current reference potentiometer (102);

a differential amplifier (92) having a pair of inputs (84) connected across said shunt, and an output;

a first comparator (98) having a first input connected to said differential amplifier (92) output, a second input connected to said reference potentiometer (102), and an output;

a latch (103) having a first input connected to said comparator (98) output, a second input connected to said first means (22) and to said logic gate (84) first input, and an output;

a voltage divider (114); and,

a second comparator (110) having a first input connected to said latch (103) output, a second input connected to said voltage divider (114), and an output connected to said logic gate (84) second input; and,

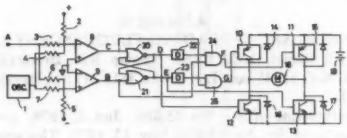
wherein said controllable supplying means (18) is adapted to receive said digital blocking signal and block the delivery of current from said power source (32) to said motor (12) in response to said received blocking signal.

4,514,666

PULSE WIDTH MODULATION D.C. SERVO MOTOR DRIVING CIRCUIT

Hayao Suzuki, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,879
Claims priority, application Japan, Nov. 9, 1982, 57-196206
Int. Cl.³ H02P 1/22
U.S. Cl. 318—293 **4 Claims**



1. In a pulse width modulation d.c. servo motor driving circuit having a triangular wave oscillator and two voltage comparators for producing a forward direction driving pulse and a reverse direction driving pulse by pulse width modulation according to the driving direction and driving intensity in response to an analog driving command signal whose level varies with the passage of time, the forward direction driving pulse and the reverse direction driving pulse being alternately output when the analog driving command signal is zero, to operate the motor in forward and reverse directions by switching a transistor bridge circuit in accordance with the modulated pulse signals: a flip-flop circuit connected to be reset/set in response to the forward direction driving pulse or the reverse direction driving pulse, two delay circuits connected to the flip-flop circuit for providing a delay time to the forward and reverse direction driving pulses which are output from the flip-flop circuit, the time delay being longer than the pulse width of the forward and reverse direction driving pulses during the time the analog driving command signal is zero, a first AND circuit for carrying out an AND operation between the forward direction driving pulse and the time-delayed forward direction signal output from one of the delay circuits, a second AND circuit for carrying out an AND operation between the reverse direction driving pulse and the time-delayed reverse direction signal output from the other of the delay circuits, means for applying the forward and reverse direction driving pulses to a first set of transistor switches of the transistor bridge circuit which are connected to one terminal of a driving power source for driving the first transistor switches, and means for applying the output signals from the first and second AND circuits to a second set of transistor switches of the transistor bridge circuit which are connected to the other terminal of the driving power source for driving the second transistor switches.

4,514,667

METHOD AND APPARATUS FOR THE CONSTANT SPEED CONTROL OF BRUSHLESS DC MOTORS

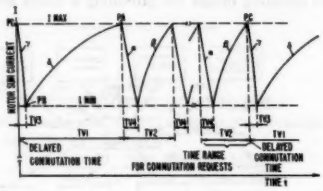
Walter H. Sakmann, Nufringen, and Volker Zimmermann, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,843

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 8210367

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 10 Claims



1. A method for the constant speed control of a brushless DC motor whereby a pulsed control voltage is applied between commutation points of motor pole windings thereof, comprising the steps of:

calculating the pulse-on times and pulse-off times of the pulsed control voltage according to the speed characteristics of the motor; applying the pulsed control voltage to the motor pole windings so that the motor sum current substantially rises during the pulse-on time and substantially drops during the pulse-off times; and

synchronizing the commutation points with the pulse-off times of the pulsed control voltage;

wherein the speed characteristics used to calculate the pulse-on and pulse-off times include the values of:

the deviation of the motor speed from a desired speed value;

the instantaneous acceleration of the motor;

the time duration of a control voltage pulse period of a preceding commutation period; and

constants characterizing the motor drive system; and

wherein, upon starting the motor, the control voltage pulse period is limited to a predetermined maximum value.

4,514,668

D.C. MOTOR DRIVING CIRCUIT

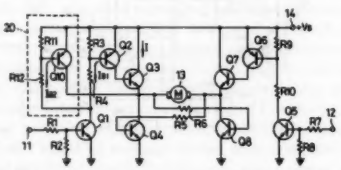
Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 13, 1983, Ser. No. 503,630

Claims priority, application Japan, Jun. 15, 1982, 57-88889[U]

Int. Cl.³ H02P *1/22*

U.S. Cl. 318—294 5 Claims



1. A D.C. motor driving circuit comprising:

a first transistor circuit coupled between a D.C. motor and a power source, for supplying a current to said D.C. motor, said first transistor circuit comprising an initial stage transistor and a terminal stage transistor respectively connected in Darlington pair;

a switching transistor respectively coupled to said initial stage transistor of said first transistor circuit, said switching transistor being turned ON when supplied with a driving signal voltage to put said first transistor circuit in an ON state; and

a second transistor circuit including a transistor coupled in parallel to said first transistor circuit, for supplying a current to said D.C. motor,

said current supplied to said D.C. motor decreasing as the rotational speed thereof increases after starting of said D.C. motor,

said first transistor circuit being turned OFF when the rotational speed of said D.C. motor reaches a speed near its constant normal rotational speed,

said D.C. motor being supplied with the current from said second transistor circuit during the constant normal rotation thereof.

4,514,669

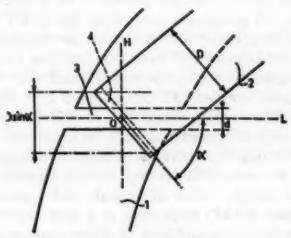
END OF TRAVEL STOP DEVICE FOR AN ELECTRIC MOTOR DRIVE MECHANISM

Auguste L. Ecole, Paris, France, assignor to Equipements Automobiles Marchal, Issy-Les-Moulineaux, France

Continuation of Ser. No. 486,995, Apr. 21, 1983, abandoned, which is a continuation of Ser. No. 258,364, Apr. 28, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 586,346

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—443 12 Claims



11. An end of travel stop device for a mechanism driven by an electric motor, particularly for windscreen wipers of motor vehicles, said device comprising: a connector having at least one circular track, a contact arm displaceable along said track, means for moving said contact arm and said connector relative to each other in response to rotation of the electric motor, said contact arm and connector cooperating to control energization of and de-energization of the motor, during said relative rotation, said track of the connector defining a plane and comprising at least one substantially flat electrically conducting sector having first and second ends extending transversely of the track, and at least one insulated sector substantially coplanar with and between said ends of said electrically conducting sector, said contact arm displaceable along said at least one track having an elongated contact end comprised of an end of the contact arm bent to project toward said track and engaging said track with an elongated end edge thereof, said elongated end edge engaging said first end of said conductive sector along a line forming an angle with said first end, which is greater than zero and less than 90°, and engaging said second end of said conductor along a line forming an angle with said second end which is greater than zero and less than 90°.

4,514,670

ELECTRIC POSITIONING MOTOR CONTROL SYSTEM, PARTICULARLY AUTOMATIC VEHICLE ANTENNA EXTENSION SYSTEM

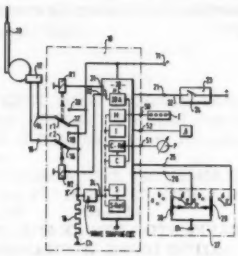
Reinhard Fassel, Oberasbach; Werner Meier, Rednitzhembach; Hans Rauch, Fürth; Jürgen Wesemeyer, Nuremberg, and Hans-Joachim Raddant, Berlin, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,152

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226614

Int. Cl.³ H02P *1/22*

U.S. Cl. 318—467 **26 Claims**



1. Electrical positioning motor control system for automatically de-energizing a commutator-type d-c motor (12) coupled to a positioned element (13) when the positioned element has reached a predetermined position, said system having

an operator-controlled switch (24, 27) for controlling energization of the motor;

motor direction-of-operation control switch means (R1, r1, R2, r2) selectively energizing the motor for rotation in either of two directions, or for de-energizing the motor;

a control circuit (30) having at least one control input (21) coupled to the operator-controlled switch and first and second outputs (31, 32) coupled to control the motor direction switch means (R1, r1, R2, r2), said system comprising, in accordance with the invention,

a measuring means (18,33) coupled to a connection line (X) of the motor (12), sensing the rotary speed of operation of the motor, when energized, and including analyzing means (33,33') responsive to a time characteristic of the waviness of undulation of motor current in said connection line to produce a motor operation speed signal;

a motor operation input (34) on said control circuit (30) and receiving the motor speed signal;

a memory (M) in said control circuit (30) storing a representation of the average value of said time characteristic; and

a speed-signal-responsive circuit (S) in said control circuit (30), connected to and controlling the electrical energy supplied to the motor and disconnecting said energy supply thereto upon sensing drop-off of speed of operation of the motor below a predetermined limit, regardless of the position of the operator-controlled switch means (24).

4,514,671

HEAD SCANNING SERVO SYSTEM IN A RECORDING AND/OR REPRODUCING APPARATUS

Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,963

Int. Cl.³ G05B *19/28*

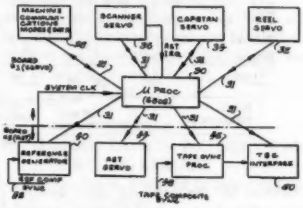
U.S. Cl. 318—603 **18 Claims**

1. A servo control apparatus for controlling the rotational velocity and phase of a rotating mechanism driven by a drive means, said apparatus comprising:

means for providing a signal at a predetermined location during each revolution of said rotating means;

first servo means for controlling the rotational velocity of said rotating mechanism and including a first high resolution counting means for providing a count indicative of the period of rotation of the rotating mechanism, said counting means being reset and triggered by a reset signal;

second servo means for controlling the phase of the rotation of the rotating mechanism and including a second high resolution counting means for providing an output at a predetermined count, said second counting means being triggered by a reference phase signal, a third high resolution counting means for providing a count indicative of



the phase position of said rotating mechanism and triggered by said second counting means output, said third counting means being reset and triggered by said reset signal.

processing means for determining the count of said first and third counting means and for providing said reset signal to the same, said processing means comparing the determined count of said first counting means with a predetermined count and generating a first error signal and applying the same to the drive means, said processing means comparing the determined count of said third counting means and comparing the same with a predetermined count and generating a second error signal and applying the same to the drive means.

4,514,672

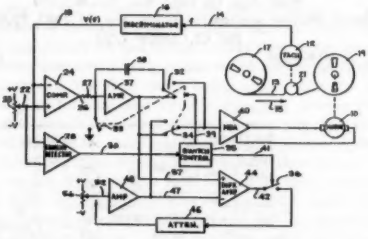
ADAPTIVE APPARATUS AND METHOD FOR CONTROL

David C. O'Gwynn, San Mateo, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 6, 1983, Ser. No. 483,004

Int. Cl.³ G05B *5/01*

U.S. Cl. 318—616 **14 Claims**



1. A method of operating a control system for controlling the value of a parameter produced by a source of energy responsive to a value of a control signal and a desired gain for maintaining a desired value of the parameter, said method comprising the steps of:

measuring the value of the parameter;

comparing the value of the parameter with the desired value; and

adjusting the control signal to effect a change in the parameter toward the desired value when the value of the parameter does not equal the desired value, and setting the control signal equal to a constant value C_n when the value of the parameter is equal to the desired value according to the relation

$$C_n = C_{n-1} + (\Delta C_{m;n-1})(k) \quad m,n = 1,2,3, \ldots$$

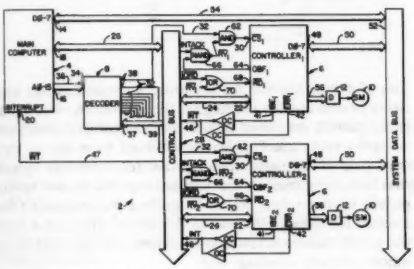
where C_{n-1} is the value of C_n during the preceeding occurrence of the parameter being equal to the desired value, $\Delta C_{m;n-1}$ is the difference between the value of the adjusted control signal when the parameter was equal to the desired value and C_{n-1}, and k is a constant.

4,514,673

STEPPER MOTOR CONTROLLER

Adrian Sfarti, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 23, 1983, Ser. No. 564,979
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—685 **12 Claims**



1. A slave microprocessor stepper motor controller, for use in conjunction with a main computer having vectored interrupt capability and including main address and data terminals, a main interrupt terminal and a main control terminal, the slave microprocessor comprising:

a stepper motor output terminal;

a slave data terminal;

a slave control terminal;

a slave select/enable terminal;

said slave microprocessor arranged and adapted to produce and transmit an accept interrupt signal at an accept interrupt terminal for transmission to said main interrupt terminal to alert the main computer that said slave microprocessor is ready to accept information through said slave data terminal, said slave microprocessor generating a slave microprocessor identifier message at said slave data terminal substantially simultaneously with production of said accept interrupt signal to identify the slave microprocessor that generated said accept interrupt signal, and said slave microprocessor also generating a signal which combines with an interrupt acknowledge signal from said main computer such that said slave microprocessor is selected to send said identifier message to said main computer;

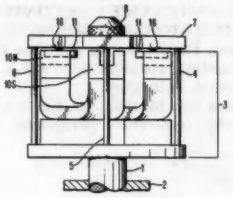
whereby at said substantially simultaneous generation of said identifier message and said accept interrupt signal by said slave microprocessor, said main computer can receive address information identifying the slave microprocessor sending the accept interrupt signal so that polling of a number of slave microprocessors is not required, and so that the use of a separate interrupt controller is not required.

4,514,674

ELECTROMAGNETIC X-Y-THETA PRECISION POSITIONER

Ralph L. Hollis, Jr., Yorktown Heights, and Bela L. Musits, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1983, Ser. No. 564,630
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—687 **5 Claims**



1. A precision X-Y-Theta positioner characterized by

(a) stator means establishing a reference plane having a beacon reference point;

(b) armature means establishing an armature plane having a reference point, said armature means and said stator means together forming motor means;

(c) armature support means, forming with said armature a spring colonnade basket support of flexure columns establishing said armature in space with freedom of motion in X, Y and Theta directions about the reference point in the armature plane;

(d) armature position and angle sensing means, mounted on said armature and said stator means, for sensing the position and angle of said armature;

(e) control computer means;

(f) feedback means connecting said armature position and angle sensing means to said control computer means;

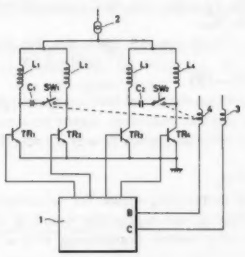
(g) motor control servo means connecting said control computer means and said motor means operatively so as to provide motive power to said armature in response to programmed desired position and angle data and position and angle sensing signals from said position and angle sensing means via said feedback means.

4,514,675

ELECTRONIC DAMPER FOR PULSE MOTOR

Hiroaki Matumoto, and Hiroshi Sekiguchi, both of Tokyo, Japan, assignors to Kanars Data Corporation, Japan

Filed Jan. 14, 1983, Ser. No. 457,890
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **7 Claims**



1. An electronic damper for a single phase excitation type pulse motor having a natural resonance frequency, including

pairs of opposed windings for generating electromotive forces of opposite polarity due to movement of said rotor, comprising capacitor and switch means coupled in series between said pairs of opposed windings, for completing, after termination of an output pulse to said pulse motor, a series resonant circuit comprised of said capacitor and said pairs of windings, wherein said series resonant circuit resonant frequency is selected from the range of one-half to twice said motor resonance frequency.

4,514,676

METHOD AND DEVICE FOR CONTROLLING A BIDIRECTIONAL STEPPING MOTOR

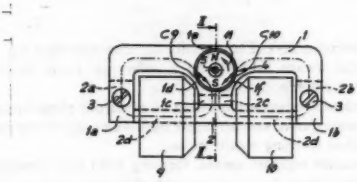
Rémy Grandjean, Fontainemelon, and Yves Guérin, Granges, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Feb. 14, 1983, Ser. No. 466,392

Claims priority, application Switzerland, Feb. 15, 1982, 918/82

Int. Cl.³ H02K 29/04

U.S. Cl. 318—696 **16 Claims**



1. A method for controlling a bi-directional stepping motor including a stator comprising an armature which has first, second and third pole faces defining therebetween a substantially cylindrical space and further comprising first and second magnetic circuits connecting the first pole face to the second pole face and the first pole face respectively, to the third pole face, the stator further comprising first and second windings which are magnetically coupled to the first and second magnetic circuits, respectively, and the motor further including a rotor comprising a permanent magnet mounted rotatably in said space, comprising applying to the first winding first current pulses of alternate directions to cause the rotor to rotate in a first direction, and applying to the second winding second current pulses of alternate directions to cause the rotor to rotate in a second direction, no current being applied to the second winding during the first pulses and no current being applied to the first winding during the second pulses.

4,514,677

TWO STAGE ELECTRICAL BRAKING FOR A VARIABLE SPEED AC INDUCTION MOTOR

George A. Kaufman, III, and Mark J. Kocher, both of Charlottesville, Va., assignors to General Electric Company, Charlottesville, Va.

Filed Jun. 15, 1983, Ser. No. 504,486

Int. Cl.³ H02P 3/24

U.S. Cl. 318—759 **2 Claims**

1. A two-stage electrical braking system for a variable speed alternating current induction motor powered from a variable voltage, variable frequency power source, the system comprising:

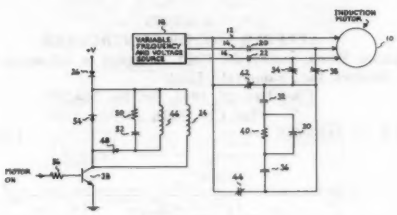
a capacitor;

capacitor connecting means for selectively connecting said capacitor across a primary winding of the motor, said connecting means comprising a first pair of normally closed contact sets and a second pair of normally open contact sets;

means for connecting one set of said first pair of contact sets in series with one set of said second pair of contact sets between one terminal of said capacitor and a terminal of the motor,

means for connecting another set of said first pair of contact sets in series with another set of said second contact sets between another terminal of said capacitor and another terminal of the motor;

control means including a first actuating means for controlling the operation of said first pair of contact sets and a second actuating means for controlling the operation of said second pair of contact sets, said first actuating means being responsive to the interruption of power thereto for causing said first pair of contact sets to revert to their normally closed state whereby said capacitor is connected in parallel with the motor primary winding, and said second actuating means being responsive to the interruption of power thereto for initiating a predetermined time delay period and for causing, at the expiration of said time delay period, operation of said second pair of contact sets whereby said capacitor is disconnected from the motor;



a third pair of normally open contact sets operable by said first actuating means for connecting the motor to the power source when power is applied thereto, said third contact sets being effective to disconnect the motor from the power source when said capacitor is connected to the motor primary winding; and

a fourth pair of normally closed contact sets, said fourth pair of contact sets being arranged for normally short circuiting the motor primary winding, said second actuating means permitting said fourth contact sets to revert to their normally closed states when said capacitor is disconnected from the motor at the expiration of said time delay period.

4,514,678

DIGITAL CONTROL DEVICE FOR AN INVERSE RECTIFIER

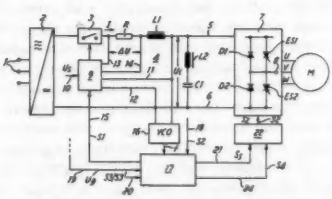
Kjeld Kückelhahn, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 28, 1984, Ser. No. 594,254

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313120

Int. Cl.⁴ H02P 5/40

U.S. Cl. 318—807 **14 Claims**



1. A digital control device for an inverse rectifier having controllable switching elements for driving an A.C. motor operable at a variable frequency, comprising, (a) pulse genera-

tor means for producing timing pulses at a multiple of the frequency of said inverse rectifier, said pulse generator means including divider means, a (location) counter controlled by said timing pulses, a control store having at least two storage zones occupied by different control tables having control data for generating periodically changing signal patterns for the ignition and extinction signals for said controllable switching elements, table selecting apparatus responsive to setting and operating parameters for effecting the switching between two control tables of said control store for each one of said parameters, synchronizing means for clocking said table setting apparatus to effect switching of said tables only on the completion of the signal pattern generated by the related table, said table selecting apparatus including a detector of the frequency of said inverse rectifier and operating to deliver a first selecting signal below a predetermined frequency and a second selecting signal above said frequency, said synchronizing means being operative to set the modulo for said divider means depending on said predetermined frequency and being operative to reset said counter every time the locations of an actual control table are run through, said second selecting signal operating to activate a control table having a lower number of memory locations than for the first selecting signal and a corresponding reduction of said timing pulses.

4,514,679

SECONDARY SWITCH CONTROLLER CIRCUIT FOR POWER SUPPLY

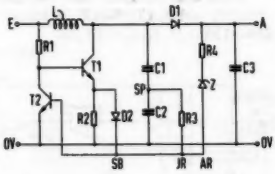
Rudolf Schierjott, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,417

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1982, 3213869

Int. Cl.³ G05F *1/64*; H02P *13/32*

U.S. Cl. 323—222 **6 Claims**



1. In a seconday switch controller having an input circuit with an inductance and a semiconductor switch element and an output circuit with a rectifier and a smoothing element, the combination comprising; an internal control loop connected to said inductance and responsive to the voltage at said inductance for producing a first signal, an external control loop connected to said output circuit and responsive to the voltage at said rectifier for producing a second signal, and a current limit circuit connected to said input circuit and responsive to the current therethrough for producing a third signal, said internal control loop comprising a capacitive voltage divider including two capacitors in series with a tap there between said current limit circuit having a first semiconductor control element connected to said semiconductor switch element, and including a diode connecting said first semiconductor control element to said semiconductor switch element, means for connecting said first semiconductor control element to said capacitive voltage divider, and means for connecting said semiconductor control element to said external control loop.

4,514,680

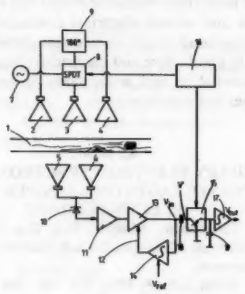
FLAW DETECTION SYSTEM USING MICROWAVES

Sakari Heikkilä, and Martti Tiuri, both of Espoo, Finland, assignors to A.Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jan. 28, 1983, Ser. No. 461,697

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 A **6 Claims**



1. Apparatus for detecting knots in lumber moving in relation to said apparatus, comprising:

first and second transmitting aerials positioned to transmit microwave radiation with 180° phase shift between them to one side of the lumber,

a third transmitting aerial disposed between and in line with the first and the second transmitting aerials,

a control unit for connecting a microwave generator at regular intervals simultaneously to both of the first and second aerials and to the third transmitting aerial at different intervals with the same regularity and between the transmission intervals to none of said transmitting aerials.

at least one receiving aerial positioned to receive the radiation passed through the lumber,

a detector for measuring the received radiation,

a loop containing an automatic gain control amplifier and an integrator for adjusting the level of the signals from said detector in such a way that the mean value of the signals equals an interval stabilized reference value, and

a zero set and sampling switch controlled by said control unit for causing only the signals originating from the first and second transmitter aerials to pass through and in its zero position when no aerial is radiating to restore the signal level to zero.

4,514,681

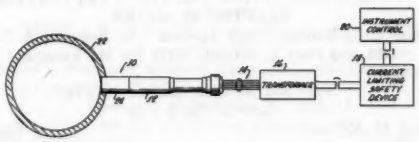
FLUSH ELECTRICAL RESISTANCE CORROSION PROBE

Charles M. Finley, and Clifford G. Moore, both of Arcadia, Calif., assignors to Rohrback Corporation, Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 447,611, Dec. 7, 1982, abandoned. This application Apr. 18, 1983, Ser. No. 486,108

Int. Cl.³ G01R *27/02*

U.S. Cl. 324—65 CR **16 Claims**



1. A flush electrical resistance corrosion probe comprising

an elongated tubular probe body having an outer wall and an open forward end,

an electrically conductive corrosion test membrane extending across and sealing said open end, said test membrane having a thickness considerably less than the thickness of said probe body wall,

a reference element mounted within said probe body,

means for measuring resistance of said test membrane including first and second electrical conductors connected to first and second points on said test element, and

a thermally conductive and electrically nonconductive support material in said probe body in supportive contact with said test membrane.

4,514,682

SECONDARY ELECTRON SPECTROMETER FOR MEASURING VOLTAGES ON A SAMPLE UTILIZING AN ELECTRON PROBE

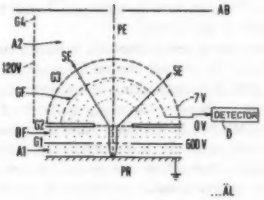
Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,542

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138929

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.3 **1 Claim**



1. A secondary electron spectrometer for detecting the energy distribution of secondary electrons from a measuring point on a sample independent of the angular distribution of said secondary electrons, said spectrometer inclucing an electron detector and comprising in sequence between said sample and said detector;

an extraction electrode generating an extraction field for accelerating said secondary electrons from said sample;

a deceleration electrode generating a deceleration field for decelerating said secondary electrons after passing through said extraction field;

a hemispherically symmetrical electrode generating another deceleration field for further decelerating said secondary electrons, said hemispherically symmetrical electrode isotropically decelerating said secondary electrons; and

an acceleration electrode generating another extraction field for accelerating said secondary electrons toward said detector.

4,514,683

TAMPER INDICATING AND THEFT PREVENTING ELECTRICAL METER

Richard L. Deibert, 24404 Attwood Ave., Sunnymead, Calif. 92388, and Gary L. Mikeal, 35375 Fir St., Yucaipa, Calif. 92399

Filed Sep. 30, 1982, Ser. No. 431,814

Int. Cl.³ G01R *1/00*

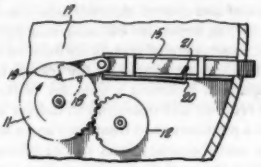
U.S. Cl. 324—110 **15 Claims**

1. A watt-hour meter that measures the flow of electricity in a pair of line conductors, said meter comprising:

(a) means for electrically connecting said meter to said line conductors in an upright position or in an inverted position;

(b) winding means responsive to the flow of electricity in the line conductors;

(c) metering movement responsive to the movement in the winding means, the metering movement rotating in a forward direction when the meter is upright and the metering movement rotating in a reverse direction when the meter is inverted;



(d) flagging means that is actuated by the metering movement rotating in a reverse direction; and

(e) gravity responsive stop element that prevents the reverse rotation of the metering movement, once the flagging means is actuated.

4,514,684

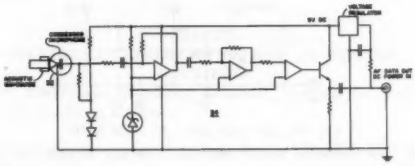
ACOUSTIC WAVEGUIDE VOLTAGE MONITOR

Kenton L. Haynes; William P. Sherer, both of Huntsville; Hugh W. Greene, Somerville; James D. Holder, and Thomas G. Roberts, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 423,973

Int. Cl.³ G01R *19/18*

U.S. Cl. 324—120 **1 Claim**

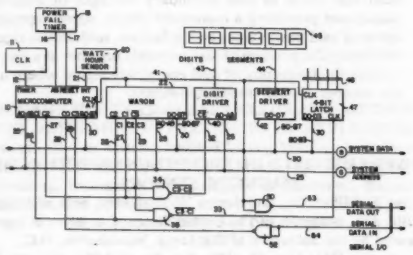


1. A measurement system in which the voltage to be measured may suddenly rise in potential to the multimegavolt level from a relatively low initial voltage level; a voltage controlled oscillator having an input connected to the voltage to be measured; the output of the voltage controlled oscillator being a frequency which is proportional to the voltage to be measured; an acoustical transmitter having an input connected to the output of the oscillator and having an output which has an acoustical signal thereon; an acoustical waveguide connected to the output of said acoustical transmitter **50** as to electrically isolate and transmit the acoustical signal to a remote location; a measuring device connected to said acoustical waveguide so as to convert the acoustical signal back to a representation of the voltage to be measured; a power system connected to the voltage control oscillator; and both the power system and the voltage control oscillator being located in the environment of the voltage to be measured.

4,514,685
INTEGRATING CIRCUIT FOR USE WITH HALL EFFECT SENSORS HAVING OFFSET COMPENSATION MEANS

Clyde Gilker, South Milwaukee, Wis., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 27, 1981, Ser. No. 287,250
Int. Cl.[3] G01R *21/08, 19/16, 1/02*
U.S. Cl. 324—142 5 Claims

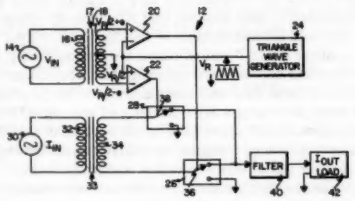


1. In an electronic watt-hour meter, an integrating circuit comprising Hall effect sensor means for sensing watt-hour consumption and for generating a first control signal corresponding to said watt-hour consumption, means for integrating said first control signal, means for generating a second control signal when the integrated signal exceeds a predetermined value, and wherein said Hall effect sensor means include a first and second bridge circuit, said first bridge circuit connected to invert said watt-hour consumption signals for connection to said Hall effect sensor means, said second bridge circuit connected to receive the output of said Hall effect sensor means for inverting said output and for cancelling DC offset voltage signals from said Hall effect sensor means.

4,514,686
POWER TRANSDUCER

Glenn A. Mayfield, West Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Aug. 31, 1981, Ser. No. 297,559
Int. Cl.[3] G01R *21/06*
U.S. Cl. 324—142 18 Claims



1. A power transducer, comprising:

input means adapted to receive a current input and a voltage input from a power source to be monitored and providing separate outputs one of which is proportional to the instantaneous current of said power source and the other of which is proportional to the instantaneous voltage of said power source;

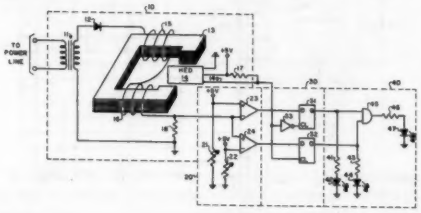
dual multiplier means having a first portion connected with said input means to receive one of said outputs therefrom, and a second portion connected with said input means to receive the other of said outputs therefrom and responsive thereto providing dual control outputs to said first portion so that said first portion, provides dual pulse width modulated output signals indicative of the instantaneous current and voltage of said monitored power source; and

output means connected with said dual multiplier means to receive said pulse width modulated output signals therefrom and responsive thereto providing an output accurately indicative of the instantaneous power of said monitored power source.

4,514,687
HALL EFFECT DEVICE TEST CIRCUIT

Hendrik W. Van Husen, Glen Ellyn, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jul. 7, 1982, Ser. No. 396,177
Int. Cl.[3] G01R *31/00, 33/12*
U.S. Cl. 324—158 R 15 Claims



1. A Hall effect device test circuit for use in a test system including a power signal source, said test circuit comprising:

magnetic field means connected to said power signal source, operated in response to said power signal to periodically provide a magnetic field of varying intensity;

voltage reference means connected to said power source, operated in response to said power signal to periodically provide a sample voltage of varying magnitude and proportional to the intensity of said magnetic field;

a Hall effect device connected in magnetic field proximity to said magnetic field means, operated in response to each magnetic field of a first predetermined intensity to provide an operate signal, and operated in response to each magnetic field of a second predetermined intensity to provide a release signal;

comparison means connected to said voltage reference means operated in response to said sample voltage having a magnitude less than a first predetermined threshold to provide a first comparison signal and further operated in response to said sample voltage having a magnitude greater than a second predetermined threshold to provide a second comparison signal;

storage means connected to said comparison means and said Hall effect device, operated in response to each operate signal and said first comparison signal to provide a first storage signal and further operated in response to each release signal and said second comparison signal to provide a second storage signal; and

signaling means connected to said storage means, operated in response to said first storage signal to provide a first status signal and further operated in response to said second storage signal to provide a second status signal.

4,514,688
DIGITAL TABLET SYSTEM WITH CALIBRATION MEANS

Albert L. Whetstone, Stratford, Conn., assignor to Summagraphics Corporation, Fairfield, Conn.

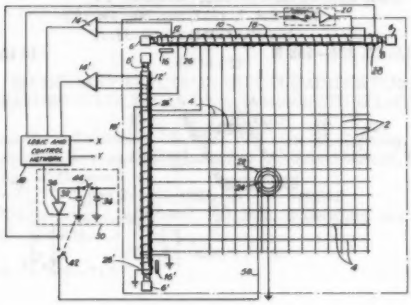
Filed Jun. 23, 1980, Ser. No. 162,311
Int. Cl.[3] G01B *7/14;* G08C *21/00*
U.S. Cl. 324—208 21 Claims

1. An automatic coordinate determining device comprising: a tablet having a grid of parallel spaced electrical conduc-

tors, and a magnetostrictive element with an axis transverse to said conductors,

a pointer movable over a surface of said tablet and including a flux producing element inductively coupled to at least one of said parallel conductors,

means for energizing said flux producing element to induce an electrical current in said one conductor, said current in turn inducing a first strain wave in said magnetostrictive element at a region adjacent said one conductor, said strain wave being propagated along said axis, and first reference signal generating means for introducing a second strain wave at a first reference position along said axis at a determined time relative to the energizing of said flux producing element, and



a timer responsive to the arrival of said first and second strain waves at a second predetermined reference position along said axis for producing a coordinate output signal having a characteristic indicative of the position of said pointer on said tablet, and

second reference signal generating means inductively coupled to said magnetostrictive element at a third predetermined position therealong for inducing a third strain wave in said magnetostrictive element.

4,514,689

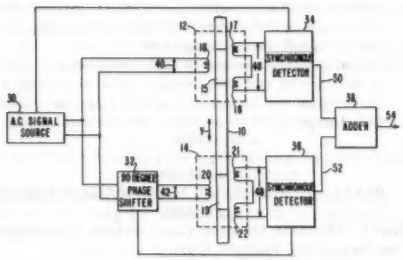
HIGH RESOLUTION POSITION SENSING APPARATUS WITH LINEAR VARIABLE DIFFERENTIAL TRANSFORMERS HAVING PHASE-SHIFTED ENERGIZING SIGNALS

William A. Gerard, Andover, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 27, 1982, Ser. No. 453,418

Int. Cl.[3] **G01B** *7/14;* **H01F** *21/06;* **G08C** *19/08;* **G01R** *33/00*

U.S. Cl. 324—208 **9 Claims**



1. Apparatus for sensing the position of a movable member, comprising:

a plurality of position transducer means each comprising a magnetic core coupled to said movable member, a primary coil and two series-connected secondary coils;

input means for providing an energizing signal to said primary coil of each transducer means, said energizing signals having the same frequency but having differing relative phases and being operative to induce in said secondary coils secondary voltages of differing relative phases; and

output means for detecting the peak value and polarity of each half cycle of said secondary voltages of differing phases and providing a composite output signal representative of said peak values and polarities, said output signal indicating the position of said movable member at a rate of n times the frequency of said energizing signal where n is the number of said transducer means.

4,514,690

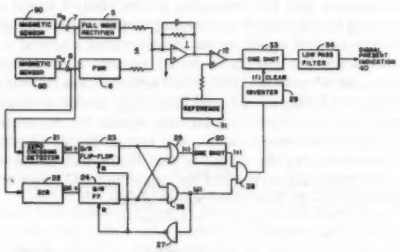
POWER LINE FIELD INTERFERENCE REJECTION FOR MAGNETIC SENSORS

Walter E. Miller, Jr., and James W. McKelvy, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,453

Int. Cl.[3] **G01R** *33/00;* **H03K** *5/00*

U.S. Cl. 324—225 **5 Claims**



1. A target detector system comprising first and second sensors having first and second outputs respectively; first and second output signals appearing respectively on said outputs upon detection of the target; said first and second output signals having a near quadrature time relationship to each other; large unwanted ac interference output signals being periodically generated by said sensors; said interference output signals on the first and second outputs of said first and second sensors being in-phase or 180° out-of-phase with relationship to each other; first and second zero crossing detectors connected respectively to said first and second sensors for producing an output upon detecting a zero crossing of any signal from said sensors; a first circuit connected to the outputs of said first and second zero crossing detector; said first circuit having a first circuit output signal when said first and second zero crossing detectors have outputs which are simultaneous or are in a close time relationship to each other relative to the quadrature time relationship of the first and second output signals produced by the detection of a target; said first circuit not having a first circuit output signal when said zero crossing detectors have outputs which are delayed with respect to each other in a time relationship close to the quadrature time relationship; a non-linear filter connected to the outputs of said first and second sensors such that the interference output signal will be doubled in frequency while reducing the frequency of the first and second output signals having quadrature time relationship; a low pass filter connected to an output of said non-linear filter such that most of the unwanted interference output signals will be blocked from passing through said low pass filter; a second circuit connected to an output of said low pass filter, the output of said first circuit being connected to said second circuit such that said second circuit will not pass any signal from said low

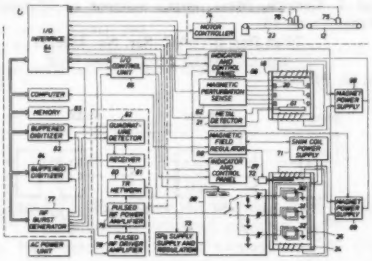
pass filter when said first circuit has an output signal; and said second circuit passing a signal from said low pass filter when said first circuit does not have an output signal; and said output of said second circuit being an indication of a detection of the target.

4,514,691

BAGGAGE INSPECTION APPARATUS AND METHOD FOR DETERMINING PRESENCES OF EXPLOSIVES

Armando De Los Santos; James D. King; William L. Rollwitz; George A. Matzkanin, all of San Antonio, Tex., and Phillip A. Hornung, Fremont, Calif., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 15, 1983, Ser. No. 485,220
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—301 **26 Claims**



1. Apparatus for conducting baggage inspection for explosives characterized by having a relatively long T_1 and relatively short T_2, the apparatus comprising:

(a) a conveyor system for receiving and moving a bag thereon, the bag to be investigated for explosives above a certain quantity therein;

(b) magnet means for forming lines of flux across the path of said conveyor system to intercept baggage thereon for polarizing hydrogen nuclei in the materials of the bag and its contents;

(c) coil means for forming a right angle field to the field formed by said magnet at a selected RF frequency for an interval;

(d) particle resonance detection circuit means connected to said coil means for determining a signal from materials within the baggage;

(e) circuit means connected to said detection means for detecting signals from hydrogen in materials having a long T_1 and short T_2;

(f) wherein said coil means is comprised of serially located separately connected multiple coils, the coils being separate to inspect different volumes of space along said conveyor system;

(g) capacitor means for said coils to form separate tank circuits for each of said coils;

(h) switch means connected to said tank circuits for selectively energizing first one and then a second of said tank circuits;

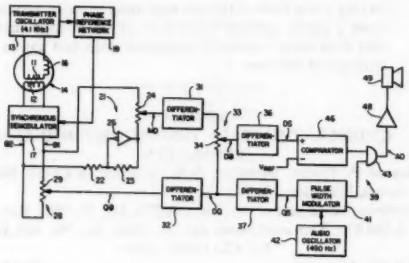
(i) pulsed RF power amplifier means for forming a pulse of specified frequency and duration to be transmitted from said coil means wherein the output thereof is applied through said switch means.

4,514,692

METAL DETECTOR AND DISCRIMINATOR USING DIFFERENTIATION FOR BACKGROUND SIGNAL SUPPRESSION

David E. Johnson, Los Banos, and Richard W. Williams, Dos Palos, both of Calif., assignors to FRL, Inc., Los Banos, Calif.

Filed May 3, 1982, Ser. No. 373,900
Int. Cl.³ G01V *3/11*
U.S. Cl. 324—329 **12 Claims**



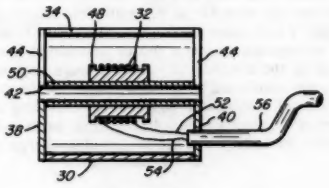
1. In apparatus for locating a metal object: transmitting means and receiving means adapted for movement relative to the metal object, means for energizing the transmitting means to produce a signal in the receiving means which changes as the receiving means is moved in proximity to the metal object, means for demodulating the received signal to provide a signal which varies in accordance with the received signal, differentiator means responsive to the demodulated signal for providing a signal which corresponds to the second derivative of the demodulated signal and has a single peak which occurs while the receiving means is passing over the metal object, and means responsive to the second derivative signal for providing an output indication when the receiving means is positioned directly over the metal object.

4,514,693

DIELECTRIC WELL LOGGING SYSTEM WITH ELECTROSTATICALLY SHIELDED COILS

Richard A. Meador, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 864,351, Dec. 27, 1977, abandoned.
This application Oct. 17, 1979, Ser. No. 85,613
Int. Cl.³ G01V *3/28*; H01F *15/04*
U.S. Cl. 324—338 **3 Claims**



1. An electrostatically shielded receiver coil system for a dielectric well logging system, comprising:

(a) a cylindrical metallic shield member;

(b) a radio frequency dielectric well logging receiver comprising a cylindrically wound wire coil wound on a spool member;

(c) said cylindrical metallic shield member having a gap formed along its length for reducing eddy current flow therein;

(d) end metallic shield closure plate members mounted at

opposite ends of said cylindrical shield member for closing the ends of same and enclosing said coil in said cylindrical shield member;

(e) a tubular support rod mounted extending between said end shield members;

(f) said support rod having said spool member mounted thereon;

(g) said support rod further serving as a shield for said coil; and

(h) each of said end metallic shield closure plate members having a slot formed therein extending radially outwardly from a center portion thereof to an outer edge thereof, said slots being formed in alignment with said gap in said cylindrical member.

4,514,694

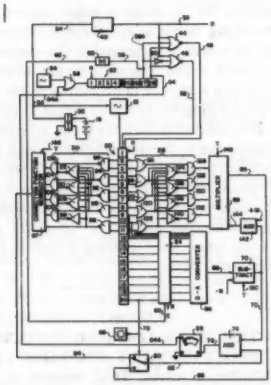
QUIESCENT BATTERY TESTING METHOD AND APPARATUS

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Mt. Kisco, N.Y.

Continuation-in-part of Ser. No. 286,271, Jul. 23, 1981, Pat. No. 4,460,870. This application Jul. 23, 1982, Ser. No. 401,383

Int. Cl.³ G01N *27/46*

U.S. Cl. 324—429 **32 Claims**



19. Apparatus for testing a quiescent battery for determining the state of charge of that battery comprising means for taking battery terminal voltage measurements, means for storing a first battery terminal voltage measurement, means for comparing a second battery terminal voltage measurement taken at a subsequent time with said first battery terminal voltage measurement and operable to determine the direction of voltage change of said second voltage measurement from said stored first voltage measurement and to generate at least one signal indicating the direction of voltage change, and visual indicating means connected to said comparison means to receive said direction of voltage change signal for providing a visual indication of the direction of voltage change as an indication as to whether the battery was last subjected to charge or discharge.

4,514,695

POCKET BATTERY TESTER

Chester P. K. Lau, 1550 Wilder Ave., Apartment - 805-A, Honolulu, Hi. 96822

Filed Sep. 3, 1982, Ser. No. 414,553

Int. Cl.³ G01N *27/46*

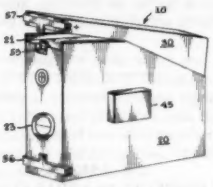
U.S. Cl. 324—437 **2 Claims**

1. An improved battery testing device consisting of:

a two piece housing comprising a upper casing, and a bottom casing, pivotally connected to another,

testing circuitry contained within the housing,

a first and second extensible contact elements, slideably disposed in respective casings, and operatively connected by leads to opposite ends of said testing circuitry; wherein the bottom casing is further provided with a pair of apertures containing third and fourth contact elements, which



are dimensioned to engage the post and receptacle terminals of a battery, and are connected by leads to opposite ends of the testing circuitry, and the bottom casing is further provided with a fifth contact element, connected to one of the said opposite sides of said testing circuitry.

4,514,696

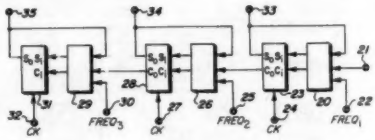
NUMERICALLY CONTROLLED OSCILLATOR

Thad J. Genrich, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1982, Ser. No. 453,371

Int. Cl.³ H03B *27/00;* **H03J** *7/06*

U.S. Cl. 328—14 **8 Claims**



1. A numerically controlled oscillator comprising:

means for providing an input indicative of a frequency;

a plurality of adding units, each adding unit comprising a one bit adder having a first input, having a second input, and having a third input, said third input being coupled to said means for providing an input indicative of a frequency, having a sum output, and having a carry output and a register having a clock input, having a first input coupled to said sum output of said adder, having a second input coupled to said carry output of said adder, having a sum output coupled to said first input of said adder and having a carry output;

said adding units being coupled in series with a first unit in said series having said second input of said adder tied to a source of a logic level signal and with each consecutive unit having a second input of an adder coupled to a carry output of a register in a previous unit in said series; and

means for providing an output coupled to each of said sum outputs of each of said registers.

4,514,697

COHERENT PHASE SHIFT KEYED DEMODULATOR WITH IMPROVED SAMPLING APPARATUS AND METHOD

Theodore H. York, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1983, Ser. No. 465,231

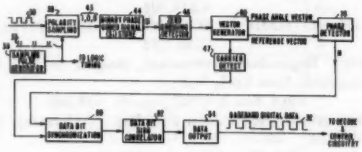
Int. Cl.³ H04L *27/22*

U.S. Cl. 329—104 **11 Claims**

7. A coherent phase demodulator for a carrier signal modulated with digital data by a phase reversal keyed modulation process, comprising:

means for sampling the instantaneous polarity of said carrier

signal, the sampling rate of said sampling means being variable, said sampling means being configured to sample said instantaneous polarity in bursts wherein samples within each of said bursts are separated by a time interval generally equal to 1/m cycles of said carrier signal and the first sample of each of said bursts is separated from the last sample of the previous burst by a time interval equal to N+1/m cycles of said carrier signal, N and m being non-zero integers;



means connected to said sampling means for deriving a phase reference signal representative of the nominal phase of said carrier signal;

means connected to said sampling means for deriving a phase angle signal representative of the present phase of said carrier signal; and

means for comparing said phase reference signal and said phase angle signal to recover said digital data.

4,514,698

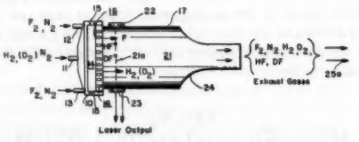
CHEMICAL LASER PUMP INCLUDING CRYOGENIC AND CONDENSING MEANS

Jack L. Blumenthal, Los Angeles County; John R. Ogren, Orange County; Eugene V. Rutkowski, and Marvin Appel, both of Los Angeles County, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 286,246, Sep. 5, 1972,. This application Apr. 11, 1980, Ser. No. 139,494

Int. Cl.³ H01S *3/095, 3/22*

U.S. Cl. 330—4.3 **8 Claims**



1. A chemical laser including a laser cavity, an exhaust, a pump for removing exhaust gases from the laser cavity at a rate and sufficiently low pressure to sustain lasing action and provide a closed system, the pump including a metal selected from the class consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, yttrium, scandium, elements 57–71 of the periodic table, lithium, sodium, potassium, rubidium, cesium, beryllium, palladium, magnesium, strontium, calcium, barium, boron, gallium and mixtures and alloys thereof;

the exhaust gases being selected from the class consisting of hydrogen, deuterium and their halides, the halogens, nitrogen, CO_2, oxygen and water vapor;

cryogenic adsorption means to remove nitrogen and CO_2; and

condensing means to remove the halides of hydrogen and deuterium and water vapor; the metal of said pump being adapted to react with oxygen, hydrogen, deuterium and the halogens to form solid reaction products therewith.

4,514,699

MICROWAVE POWER AMPLIFIER/COMBINER

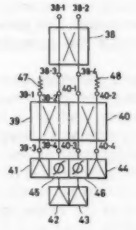
Keiichiro Kariatsumari, Inagi, and Kenji Hirai, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 21, 1982, Ser. No. 451,732

Claims priority, application Japan, Dec. 22, 1981, 56-207311

Int. Cl.³ H03F *3/60*

U.S. Cl. 330—53 **18 Claims**



1. A microwave power amplifier/combiner comprising:

a plurality of reflection type 2-amplifier combiner means each including a $\pi/2$ hybrid coupler, a $\pi/2$ phase shifter, first and second reflection amplifiers and a dummy load, said $\pi/2$ hybrid coupler having a first port to which said dummy load is connnection, a second port which is isolated from said first port and is used as an input/output port, a third port to which said first reflection amplifier is connected, and a fourth port to which said second reflection amplifier is connected via said $\pi/2$ phase shifter; and

combining means for combining the outputs of at least two of said plurality of reflection type 2-amplifier combiner means having an input port and an output port, both ports being isolated from each other, and said means for combining being connected to said respective input/output ports of said at least two reflection type 2-amplifier/combiner means.

4,514,700

OUTPUT AMPLIFIER FOR A TRANSMITTING TUBE

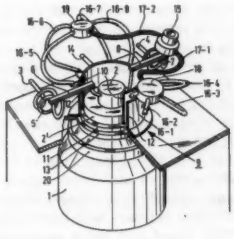
Harry Piepers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,857

Claims priority, application Netherlands, Feb. 18, 1982, 8200633

Int. Cl.³ H03F *3/60*

U.S. Cl. 330—56 **5 Claims**



1. In an output amplifier for a transmitting tube having an operating frequency in the band 40–400 MHz, said output amplifier including impedance transformation means for matching the input impedance of the transmitting tube to a predefined resistive output impedance of an apparatus for

applying to the output amplifier a signal to be amplified, said impedance transformation means comprising:

(a) a first impedance transformer including first and second coaxially-arranged cylindrical conductors, said first impedance transformer having an input end, having an output end electrically-connected to the transmitting tube, and being dimensioned such that the reactive component of its input impedance is substantially equal to zero;

(b) a second impedance transformer including n coaxial cables each having a length of approximately ¼ wavelength at the operating frequency, each cable having an input end and an output end, said output ends being electrically-connected to the input end of the first impedance transformer; and

(c) a third impedance transformer including m coaxial cables each having a length of approximately ¼ wavelength at the operating frequency, each cable having an input end and an output end, n/m being an integer defining a number of groups of the cables in the second impedance transformer, the output end of each cable in the third impedance transformer being electrically-connected to the input ends of a respective group of the cables in the second impedance transformer, and the input ends of the cables in the third impedance transformer being electrically-connected to an input for receiving the signal to be amplified.

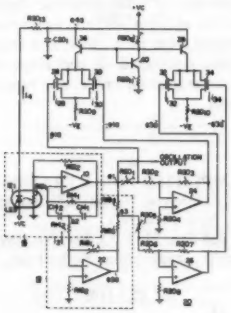
4,514,701
AUTOMATIC LEVEL CONTROL CIRCUIT

Kenji Machida, 3-3, Nishiogiminami 2, Suginami-ku, Tokyo 167, Japan

Division of Ser. No. 212,086 filed as PCT JP 78/00040, Dec. 5, 1978, published as WO 80/01224, Jun. 12, 1980, § 102(e) date Jun. 3, 1980, Pat. No. 4,430,627. This application Apr. 4, 1983, Ser. No. 482,053

Int. Cl.³ H03G *3/20, 3/10*

U.S. Cl. 330—137 **9 Claims**



1. An automatic gain control circuit comprising:

first means (12) responsive to a control signal (e4, I4) for amplifying an imput signal (ei) with a given gain (eo/ei) to generate an output signal (eo) and providing an inner signal (e1) corresponding to said input signal (ei), said given gain (eo/ei) being varied in accordance with the magnitude of said control signal (e4, I4) and said inner signal (e1) having sine function;

second means (140, 18) coupled to said first means (12) for shifting the phase of said inner signal (e1) by a given amount and providing a phase-shifted signal (e3), the phase difference between said inner signal (e1) and said phase-shifted signal (e3) being substantially 90 degrees, and said phase-shifted signal (e3) having cosine functions which correspond to the sine functions of said inner signal (e1);

third means (20) coupled to said first and second means (12, 18) and being responsive to said inner signal (e1) and said phase-shifted signal (e3), for substantially squaring a first signal (±e1a in FIG. 2) corresponding to said inner signal (e1) and a second signal (±e1a in FIG. 2) corresponding to said phase-shifted signal (e3), and providing a sum signal (e4a in FIG. 2) corresponding to the sum of the squared first signal ($e1a^2$) and the squared second signal ($e3a^2$); and

fourth means ($C20_1$, $R20_{13}$ in FIG. 2) coupled to said first and third means (12, 20) for filtering-off the higher harmonic ripples (FIG. 4C) involved in said sum signal (e4a) to provide said control signal (e4, I4).

4,514,702
LOGARITHMIC ELECTRONIC GAIN CONTROL CIRCUIT

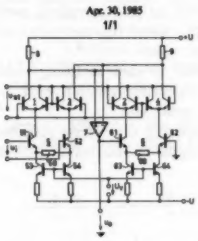
Urs Zogg, Regensdorf, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,345

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204217

Int. Cl.³ H03F *3/45;* **H03G** *3/30*

U.S. Cl. 330—254 **9 Claims**



4. An electronic gain-control arrangement composed of transistors of only one conductivity type and comprising two current distribution circuits each having first and second outputs, the output current ratio being controllable as an exponential function of the control voltage on their control inputs, a current control circuit, which supplies signal currents which are equal but in phase opposition to the inputs of the current distribution circuits and which controls their amplitude depending on the input signal of the arrangement such that the output currents on each one of the two outputs of the two current distribution circuits are proportional to the input signal and independent of the control voltage, and means for deriving the output signal of the arrangement from at least one of the output currents of the two other outputs of the current distribution circuits, which output currents are controlled in the same sense by the control voltage.

4,514,703
AUTOMATIC LEVEL CONTROL SYSTEM

John W. Maher, Woodstock, and Greg M. Townsend, Palatine, both of Ill., assignors to Motrola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1982, Ser. No. 451,310

Int. Cl.³ H03G *3/30*

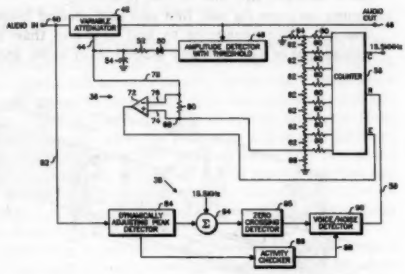
U.S. Cl. 330—279 **14 Claims**

1. In an automatic level control system receiving an input signal comprising voice and noise, having means for developing an AGC control signal, and having a variable gain circuit responsive to the control signal for varying the gain applied to the input signal, the improvement comprising:

peak detecting means for detecting, in the input signal, voice peaks which exceed a predetermined threshold while dynamically ignoring syllabic rate voice lulls which occur subsequent to a detected voice peak;

noise/voice sensing means receiving detected voice peaks from the peak detecting means for determining when voice signals are present and thereupon developing a first signal, and for developing a second signal in the absence of those detected voice peaks which signify the presence of voice; and

gain control means responsive to said first signal for permitting the AGC control voltage to vary to thereby modify the gain applied to incoming voice signals, and responsive to the second signal for preventing the value of the AGC



control signal from changing in a direction which increases the gain applied to the input signal, thereby preventing the generation of high amplitude noise signals or unintelligible voice signals.

4,514,704

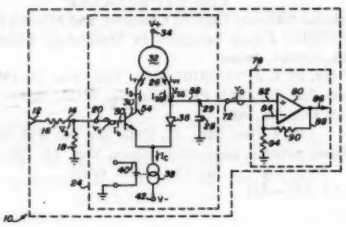
VARIABLE FILTER CIRCUIT

Douglas R. Curtis, 110 Highland Ave., Los Gatos, Calif. 95030

Filed Aug. 26, 1983, Ser. No. 526,911

Int. Cl.³ H03F *3/04*

U.S. Cl. 330/308 4 Claims



1. A low-pass variable filter circuit comprising, in combination:

an input terminal means coupled to an input node;

a variable filter stage means connected to said input node for transmitting a time varying input signal below a cutoff frequency to an output of the variable filter stage means, said variable filter stage means comprising a transistor connected to said input node for providing a voltage-to-current conversion and a first static current, a variable dynamic resistance diode for developing an output signal and electrically connected to said transistor and being an element in a resistance diode-capacitance network;

a current mirror electrically connected to said transistor and said variable dynamic resistance diode for providing a second static current for flowing into said resistance diode-capacitance network;

a current source electrically connected to said transistor and said variable dynamic resistance diode for providing a control current dependent upon a control voltage, said control current for controlling the cutoff frequency;

a capacitor connected between said current mirror and said variable dynamic resistance diode of the variable filter stage means and a first external potential, said capacitor being an element in said resistance diode-capacitance network for filtering said output signal; and

an output node connected to said capacitor for receiving said output signal.

4,514,705

LOW-NOISE DIGITALLY TUNABLE PHASE-LOCKED LOOP FREQUENCY GENERATOR

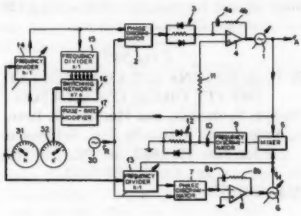
Peter Harzer, Eningen, Fed. Rep. of Germany, assignor to Wandel & Goltermann GmbH & Co. KG, Eningen, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,656

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1980, 3046486

Int. Cl.³ H03L *7/08, 7/18*

U.S. Cl. 331—2 13 Claims



2. A method of suppressing noises in the output of a digitally tunable high-frequency oscillator whose output frequency f_A is controlled via a filter network by a phase discriminator receiving a relatively low comparison frequency from a reference source and a matching feedback frequency stepped down from said output frequency f_A, at least one of the frequencies fed to said phase discriminator being adjustable for varying said output frequency f_A in coarse and fine increments,

comprising the steps of:

generating an auxiliary frequency f_H of the same order of magnitude as said output frequency f_A;

modifying said auxiliary frequency f_H by the same coarse increments as said frequency f_A;

continuously producing a difference frequency $f_D=f_A-f_H$; and

feeding a corrective voltage dependent on said difference frequency f_D to a control input of said high-frequency oscillator over a path bypassing said filter network for suppressing noises due to phase differences occurring at said filter network and varying at frequencies beyond a limiting frequency of said filter network, said difference frequency f_D being used as said feedback frequency.

4,514,706

SECOND OR HIGHER ORDER PLL WITH INCREASED LOW AND MEDIUM FREQUENCY GAIN

William J. Thompson, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1982, Ser. No. 423,361

Int. Cl.³ H03L *7/06*

U.S. Cl. 331—16 15 Claims

8. A phase-locked loop providing an increased gain capability, comprising:

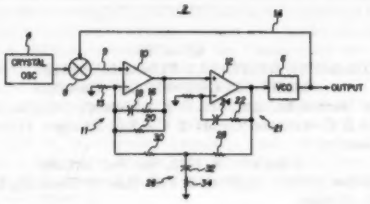
a reference oscillator,

a voltage controlled oscillator (VCO),

a phase detector for comparing the phases of the output signals of said reference oscillator and said VCO,

an amplifier circuit connected to form a signal path, including an amplifier, between the output of said phase detector and the input of the VCO, said amplifier having low

frequency-sensitive feedback means for reducing, at frequencies approaching DC, the gain of said amplifier



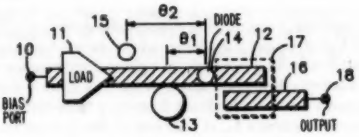
below its maximum gain, so as to prevent saturation of the amplifier at said frequencies approaching DC.

4,514,707

DIELECTRIC RESONATOR CONTROLLED PLANAR IMPATT DIODE OSCILLATOR

Michael Dydyk, Scottsdale, and Herbert W. Iwer, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1982, Ser. No. 388,762
Int. Cl.³ H03B *7/00*
U.S. Cl. 331—107 SL **17 Claims**



1. An oscillator comprising:
a bias port, being fixedly attached to receive a bias input of the oscillator;
a first transmission line coupled to said bias port;
an IMPATT diode fixedly attached to said first transmission line;
a frequency independent stabilizing load coupled to said first transmission line between said IMPATT diode and said bias port;
a plurality of resonance circuit means electro-magnetically coupled to said first transmission line between said IMPATT diode and said frequency independent stabilizing load; and
means for providing an output coupled to said IMPATT diode.

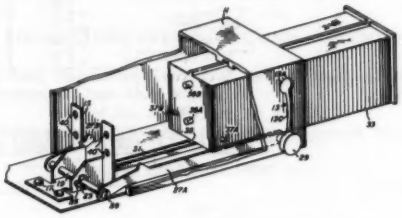
4,514,708

QUICK DISCONNECT WAVEGUIDE LOCKING MECHANISM

Gerald W. Ludtke, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,629
Int. Cl.³ H01P *1/00*
U.S. Cl. 333—255 **4 Claims**

1. A mechanism for holding in locked, force multiplied engagement within a housing a communications module assembly and a waveguide assembly, said mechanism comprising:
first and second lever arms having first and second ends,
a mounting bracket secured to the housing and a pivot shaft having first and second ends secured to said mounting bracket,
said first end of said first lever arm mounted on said first end of said pivot shaft,
said first end of said second lever arm mounted on said second end of said pivot shaft,
locking means coupled to said first lever arm second end,
a channel in said housing for slidably retaining said locking means in the housing and allowing said locking means to move between first and second positions,
camming surfaces on said first and said second lever arms that are more proximate to said first end than to said second end of said first and second lever arms, and



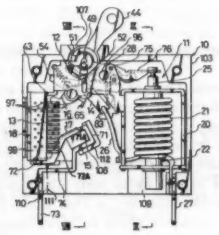
aligning pins mounted on the communications module assembly and engaging said camming surface on said first and said second lever arms when said locking means is moved from said first position to said second position,
whereby movement of said locking means from its first position to its second position causes said aligning pins to force the communications module assembly into a force multiplied engagement with the waveguide assembly.

4,514,709

CIRCUIT BREAKER

Kunimitsu Nakano; Takaaki Chuzawa, and Masaru Ohmuro, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP83/00101, § 371 Date Jun. 23, 1983, § 102(e) Date Jun. 23, 1983, PCT Pub. No. WO83/03496, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 31, 1983, Ser. No. 518,300
Claims priority, application Japan, Mar. 31, 1982, 57-50914
Int. Cl.³ H01H *9/30*
U.S. Cl. 335—201 **5 Claims**



1. A circuit breaker comprising:
a casing,
a manually actuable contact opening and closing mechanism including
a handle rotatably mounted within said casing and projecting out of said casing,
a link member operably connected to said handle to be shifted between first and second positions in response to rotation of said handle, said link member being pivotable relative to said handle about a first pivot axis, and
trip means comprising a lever shiftable between:
a normal position in which said lever engages said link member when the latter is in said second position, and

an abnormal position in which said lever is disengaged from said link member,

a movable contactor pivotably carried by said link member and including a movable contact,

a fixed contactor having a fixed contact arranged to be:

disengaged from said movable contact when said link member is in said first position, and

engaged by said movable contact when said link member is in said second position and is engaged by said lever,

an electromagnetic device including a coil which detects an overcurrent and means operably connected to said lever for responding to the sensing of an overcurrent to shift the lever to said abnormal position to release said lever from said link member when the latter is in said second position,

means for rotating said link member about said first pivot axis when said link member is in said second position and is released from said lever, whereby said movable contact is displaced in a path of travel to become disengaged from said fixed contact,

arc suppressing means disposed adjacent said fixed contact and including an interior recess coinciding with said path of travel of said movable contact such that said movable contact enters and moves along the interior of said arc suppressing means when moving in said path of travel,

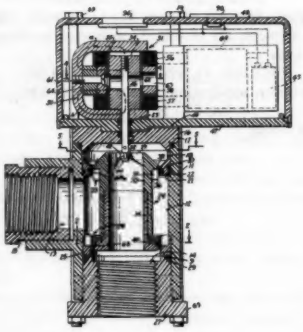
said fixed contactor including a terminal end connectible to a source of current and a tip end located remotely of said terminal end and adjacent a first longitudinal end of said arc suppressing means, said fixed contactor further including first and second sections located intermediate said terminal end and said tip end, said first section carrying said fixed contact and locating same exteriorly of said arc suppressing means and spaced from a longitudinal axis of the latter at a level situated between the longitudinal ends of said arc suppressing means, said second section extending from said first section toward said tip end so as to extend toward said first longitudinal end of said arc suppressing means in a direction which is oriented diagonally relative to said longitudinal axis of said arc suppressing means.

4,514,710

ELECTROMAGNETIC ACTUATOR

Richard A. Conrad, 1422 Phillips St., Vista, Calif. 92083

Division of Ser. No. 344,610, Feb. 1, 1982, Pat. No. 4,429,716.
This application Jan. 30, 1984, Ser. No. 575,064
Int. Cl.³ H01F *3/14*
U.S. Cl. 335—230 **3 Claims**



1. A reversible actuator comprising:

a u-shaped structure of magnetic material,

said structure having a pair of spaced legs,

a permanent magnet in magnetic coupling relation with said structure, said magnet extending intermediate said legs,

an armature of magnetic material movable in one direction to a first position in engagement with a first one of said legs whereby to magnetically latch said armature in said first position,

said armature being movable in the opposite direction to a second position in engagement with the second one of said legs whereby to magnetically latch said armature in said second position,

a sleeve of non-magnetic material surrounding said armature and fitting between said legs,

said sleeve guiding said armature for movement between said first and second positions,

an annular member of magnetic material surrounding an intermediate portion of said sleeve,

a first electromagnetic coil surrounding said sleeve intermediate said member and said first leg for driving said armature between said first and second positions thereof,

a second electromagnetic coil surrounding said sleeve intermediate said member and said second leg for driving said armature between said first and second positions thereof,

means for attaching said magnet to said magnetic structure and to said annular member, and

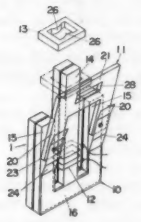
means for energizing said coils in a manner to selectively drive said armature in either of said directions.

4,514,711

AC DRIVE ELECTROMAGNETIC RELAY

Mitsuki Nagamoto, Tsu, and Takuo Kubota, Ise, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 30, 1984, Ser. No. 636,030
Claims priority, application Japan, Jul. 30, 1983, 58-139631
Int. Cl.³ H01F *7/10*
U.S. Cl. 335—243 **7 Claims**



1. An AC current electromagnetic relay comprising;

a yoke formed into a generally E-shaped configuration with an elongated center leg and shortened side legs extending from a common base so that the free end portions of the respective legs define apexes of a triangle;

a coil disposed around the center leg of the yoke;

a shading ring disposed around the center leg;

a generally U-shaped flat armature having a pair of parallel arms connected by a web and being mounted on one surface of the yoke in substantially parallel relationship therewith;

a switching contact assembly including at least one pair of contacts which cooperates with the armature to make and break the contacts;

bearing means by which said U-shaped armature is pivotally supported at the free end edges of the arms on the surface of the yoke with its arms partially overlapping on the side legs of the yoke and with its web confronting the free end portion of the center leg, whereby upon energization of the coil the armature is pulled toward the yoke to be in a set position where the arms and the web of the armature abut respectively with said free end portions of the center and side legs defining the apexes of the triangle so as to establish a three-point contact between the yoke and the armature; and

biasing means for biasing the armature away from the yoke.

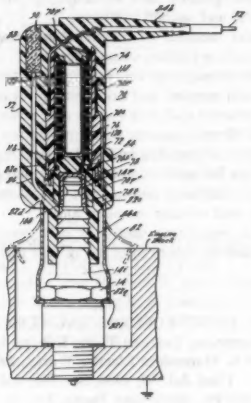
4,514,712
IGNITION COIL

John A. McDougal, 2314 E. Court St., Flint, Mich. 48503

Continuation of Ser. No. 549,717, Feb. 13, 1975, abandoned, and a continuation-in-part of Ser. No. 384,469, Aug. 1, 1973, abandoned. This application Apr. 7, 1978, Ser. No. 894,449

Int. Cl.³ H01F *27/04, 27/30*

U.S. Cl. 336—96 33 Claims



1. For an ignition system of an engine including a spark plug having a spark plug terminal, a grounded portion and a dielectric portion separating said grounded portion and said spark plug terminal, said spark plug being adapted to ignite an air/fuel mixture in a chamber of the engine when energized by a secondary voltage applied to said spark plug terminal, an ignition coil structure for removable mounting directly on said spark plug comprising:

a primary winding for receiving a primary voltage at an input conductor thereof and a secondary winding for providing said secondary voltage;

secondary terminal means connected to said secondary winding for receiving said secondary voltage and being removably connectable to said spark plug terminal for providing said secondary voltage to said spark plug terminal; and

enclosure means formed of a dielectric material and surrounding said primary winding, said secondary winding and said input conductor of said primary winding to dielectrically seal the entirety of said primary winding, said secondary winding, and said input conductor for said primary winding, said enclosure means also partly surrounding said secondary terminal means and having a sealing portion for removable sealing engagement with said dielectric portion of said spark plug so that said removable sealing engagement at said dielectric portion of said spark plug dielectrically encloses said secondary terminal means whereby no direct path to a grounded structure exists between said removable sealing engagement and said secondary terminal means, said enclosure means being configured so that a space is created intermediate said dielectric portion of said spark plug and said sealing portion of said enclosure means at least upon initial mounting of said ignition coil structure on said spark plug, said enclosure means including a passage means having an entrance communicating with said space between said dielectric portion of said spark plug and said sealing portion of said enclosure means for allowing egress of matter in said space to facilitate mounting of said ignition coil structure on said spark plug and to prevent said ignition coil structure from being lifted off said spark plug upon the heat expansion of said matter in said space, said passage means extending along said enclosure means in a manner so that said passage means length is substantially greater than the thickness of said enclosure means in the vicinity of said entrance and so that said passage means length is sufficiently long to provide an electrically secure path therealong relative to said secondary voltage to prevent flashover along said passage from said secondary terminal means to a grounded structure.

4,514,713
INDUCTIVE BALLAST COATED WITH AN INSULATION LAYER AND METHOD OF COATING THE BALLAST

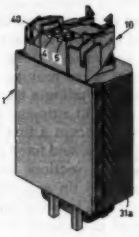
Jacobus I. M. van Dam, Oss, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,313

Claims priority, application Netherlands, Dec. 24, 1981, 8105830

Int. Cl.³ H01F *27/02, 27/04;* B05D *5/12*

U.S. Cl. 336—96 13 Claims



9. An inductive stabilization ballast comprising a core member formed of laminated magnetic elements and an electric winding mounted thereon, an electrical connection member comprising electric plug-in contact sockets, a cover made of a synthetic material covering said plug-in contact sockets, and a layer of insulating material coating the whole ballast except for the plug-in contact sockets which are accessible via an opening in the cover of synthetic material, said opening being bounded by a surface of fracture in said cover.

4,514,714
NOISE-REDUCTION DEVICE FOR STATIONARY INDUCTION APPARATUS

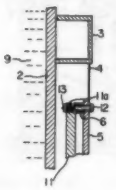
Minoru Kanoi, Ibaraki; Yasuro Hori, Katsuta, and Yuzuru Kamata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,485

Claims priority, application Japan, Feb. 20, 1982, 57-25241

Int. Cl.³ H01F *15/00*

U.S. Cl. 336—100 9 Claims



1. A noise-reduction device and a stationary induction apparatus which includes a tank filled with insulation oil and a substance of said induction apparatus mounted in said tank comprising:

a sound insulation panel provided at each of windows formed by reinforcing channels provided in the form of a latice surrounding the outer periphery of said tank, said

sound insulation panel being supported by said reinforcing channels at each of said windows through a thin plate so as to substantially cover the concerned window;

a weighty body attached to the peripheral edge of said sound insulation panel in the vicinity of the boundary between said sound insulation panel and said thin plate for reducing vibrations of said sound insulation panel; and

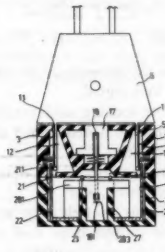
elongated dynamic dampers attached to said weighty body in a manner so that each of said dynamic dampers connects respective two of points of said weighty body at which the amplitude of vibration of said weighty body becomes substantially maximum, each of said dynamic dampers being provided with means for adjusting a natural frequency thereof.

4,514,715

SAFETY RECEPTACLE

Kun S. Chen, No. 3, Alley 3, Lane 418, Hsin-Hsing Rd., Tainan City, Taiwan

Filed May 15, 1984, Ser. No. 610,525
Int. Cl.³ H01H *61/01, 71/08*
U.S. Cl. 337—113 **8 Claims**



1. A safety receptacle, comprising:

a casing having an upper part and a lower part joined to the upper part, said upper part being provided on the top with two slots, a hole disposed between the two slots and two chambers, said lower part being provided with a middle chamber and two side chambers;

a spring-loaded cap disposed into said upper part in such a way that the top of the spring-loaded cap may extend through said hole of said upper part;

two spring-loaded sleeves disposed into said upper part, said spring-loaded sleeve being disposed at an angle into each said chamber of said upper part;

a spring-loaded push rod fixedly attached at the bottom of said cap, said push rod having a hook portion at its lower end;

a T-shaped sliding plate mounted into the middle chamber of said lower part, said sliding plate having two flanges and a hole adapted to said hook portion of said push rod;

two conducting plates respectively disposed into said two side chambers of said lower part; and

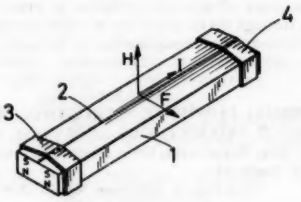
two bimetallic strips respectively welded to said two conducting plates, said two bimetallic strips being positioned behind said two flanges of said T-shaped sliding plate and being capable of pushing said sliding plate to disengage from said push rod when an excessive current flows through said bimetallic strips.

4,514,716

FUSE

Manuel A. Vincent De Araûjo, 73390 Chamoux-sur-Gelon, France

PCT No. PCT/FR81/00152, § 371 Date Jul. 20, 1982, § 102(e) Date Jul. 20, 1982, PCT Pub. No. WO82/01961, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 23, 1981, Ser. No. 403,634
Claims priority, application France, Nov. 25, 1980, 80 24971
Int. Cl.³ H01H *85/42*
U.S. Cl. 337—281 **8 Claims**



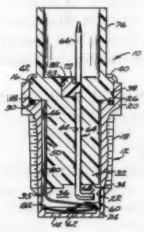
1. A fuse comprising a conducting wire (9) capable of being destroyed by melting in the case of an excess current; at least one elongated support means formed at least partially of ferrite (1) and having a top surface, a bottom surface and a thickness between said top and bottom surfaces, magnetized in the direction of its thickness and on which said conducting wire is disposed between two terminals (3, 4) spaced apart along said support means, said wire being supported along its entire length on one of said surfaces of said support means.

4,514,717

SINGLE TERMINAL SNAP ACTING THERMAL SWITCH

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 25, 1983, Ser. No. 555,246
Int. Cl.³ H01H *37/54*
U.S. Cl. 337—365 **8 Claims**



1. A condition responsive switch comprising a cylindrical metallic housing having two opposite ends, one end being open and the second end having a disc seat formed thereat, an elongated body of electrically insulative material having a longitudinal axis and having at least a portion thereof telescopically received through and closing the open end of the housing, the body having a free distal end spaced a selected distance from the disc seat to form a switch chamber, a slot extending through the body parallel to the longitudinal axis, aterminal member received in the slot and extending from a point outside the housing to a point within the switch chamber, a stationary contact mounted on the terminal member disposed in the switch chamber, a generally flat surface formed on the outer peripheral surface of the body extending parallel to the longitudinal axis over a major portion of the length of the portion of the body received in the housing, a generally "L" shaped

movable contact member of good electrically conductive material having good spring characteristics, the member having a first leg received on the flat surface and attached to the body, the first leg having a free distal end portion bent into "V" shaped converging surfaces, the "V" shaped portion biased into electrical engagement with the internal housing wall, the "L" shaped member having a second leg extending transversely across the switch cavity, a movable contact mounted on the free distal portion of the second leg adapted to move into and out of engagement with the stationary contact, a tongue struck from the second leg and bent downwardly toward the disc seat and a snap acting disc received on the disc seat and movable between concave and convex positions upon the occurrence of selected conditions to cause the movable contact, through the tongue of the movable contact member to move into and out of engagement with the stationary contact.

4,514,718

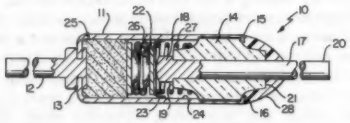
THERMAL CUTOFF CONSTRUCTION, MEMBER THEREFOR AND METHODS OF MAKING THE SAME

Linda B. Birx, Beavercreek, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 2, 1983, Ser. No. 557,238

Int. Cl.³ H01H *37/36*

U.S. Cl. 337—407 **10 Claims**



10. In a thermal cutoff construction having an electrical switching unit that changes its operating condition when a member therein melts by being heated to a certain temperature for the particular material that forms the member being utilized, the improvement wherein said material of said member comprises 4-methylumbelliferone.

4,514,719

DATA TRANSMISSION SYSTEM UTILIZING POWER LINE OF 3-PHASE ALTERNATING CURRENT

Yoshiharu Suzuki; Hitoshi Fukagawa, both of Kadoma; Yoshiyuki Komoda, Osaka, and Osamu Tanaka, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Sep. 30, 1982, Ser. No. 429,961

Claims priority, application Japan, Oct. 15, 1981, 56-164973

Int. Cl.³ H04M *11/04*

U.S. Cl. 340—310 R **10 Claims**

1. A data transmission system utilizing a power line of a 3-phase alternating current power supply for supplying a 3-phase alternating current for transmission of data in synchronism with the cycles of said alternating current, said data transmission system comprising:

At least one transmitter, each coupled to any respective one of the phases of said power line; and

at least one receiver, each coupled to any respective one of the phases of said power line;

each said transmitter comprising

lock signal generating means for generating a lock signal for providing a respective synchronization between the transmitter and each of the receivers,

data generating means for generating data to be transmitted to each said receiver, and

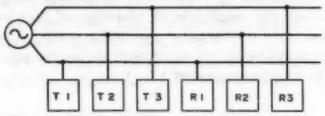
sending timing control means for controlling the sending of said lock signal and said data to have timing so that said data is sent subsequently to said lock signal, in synchronism with the cycles of the phase to which the transmitter is connected, and

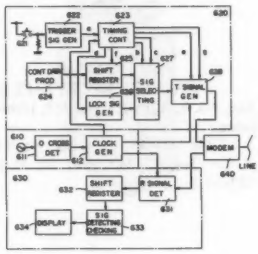
each said receiver comprising

lock signal receiving means for receiving each said lock signal in synchronism with the cycles of the phase to which the receiver is connected,

phase shift detecting means for detecting the phase shift between the phase of each said lock signal as transmitted by the respective transmitter and as received in the receiver, based on the received lock signal,

synchronizing means for providing, in response to an output from said phase shift detecting means, a respective synchronization between each said receiver receiving said





lock signal and the respective transmitter which is sending said received lock signal,

locking means for locking said synchronization means so that synchronization is maintained after said providing of said synchronization,

termination detecting means for detecting termination of said data transmission, and

lock releasing means for releasing said locking means, in response to an output from said termination detecting means, so that said synchronization can be changed.

4,514,720

METHOD AND APPARATUS FOR INCREASING THE RESPONSE SENSITIVITY AND THE INTERFERENCE RESISTANCE IN AN ALARM SYSTEM

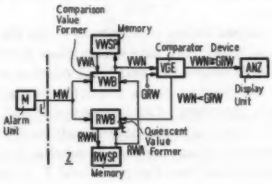
Karla Oberstein, and Peer Thilo, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 5, 1982, Ser. No. 375,316

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127324

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—511 **9 Claims**



1. A method for operating a danger alarm system for increasing the response sensitivity and the interference resistance of

the alarm system, said alarm system having a plurality of alarm units connected via a plurality of alarm lines to a central station, each of said alarm units continuously emitting measured values representing conditions monitored by said alarm units, said measured values being cyclically sampled at said central station, said method comprising for each alarm unit the steps of:

forming an alarm quiescent value from each sampled measured value emitted by an alarm unit;

subtracting a quiescent value formed from a measured value sampled immediately preceding a current measured value from said current measured value;

forming a current comparison value from the difference resulting from said subtraction;

storing said current comparison value;

comparing said current comparison value with a rated limiting value;

activating a display means for displaying an alarm if said current comparison value is greater than or equal to said rated limiting value; and

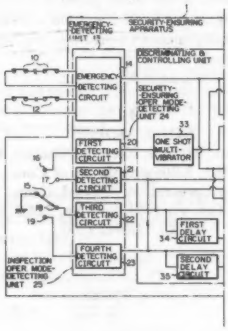
updating a quiescent value memory by replacing said quiescent value formed from said measured value sampled immediately preceding said current measured value with a quiescent value formed from said current measured value if said current comparison value is less than said rated limiting value.

4,514,721

MULTI-OPERATION MODE TYPE OF SECURITY-ENSURING APPARATUS

Toshiyuki Shiraiwa, Ichikawa, and Kaoru Ooba, Higashimurayama, both of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,148
Claims priority, application Japan, Jun. 30, 1982, 57-111444
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—527 **10 Claims**



1. A security-ensuring apparatus for ensuring the security of a predetermined area in association with emergency sensors suitably arranged in the predetermined area and a central monitoring station located distant from the predetermined area, comprising:

means for selectively setting an operation mode of said security-ensuring apparatus in a security-ensuring operation mode including a manned security-ensuring operation mode, an unmanned security-ensuring operation mode, and a management operation mode including at least a maintenance mode or a patrol mode;

an emergency-detecting means connected to said emergency sensors for electrically detecting an emergency or abnormality sensed by said emergency sensors and generating a corresponding electric signal;

a controlling means for discriminating whether or not said electric signal indicating an emergency or abnormality should be transmitted to said central monitoring station on the basis of which operation mode of said security-ensuring and management operation modes is set in said security-ensuring apparatus; and

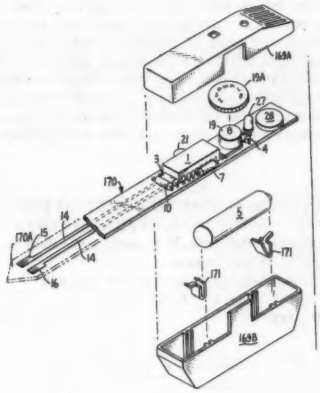
a signal-transmitting means for transmitting said electric signal indicating an emergency or abnormality to said central monitoring station when said discriminating means discriminates that said electric signal should be transmitted to said central monitoring station.

4,514,722

DOMESTIC AUTOMATIC CONTINUOUSLY MONITORING SOIL MOISTURE MONITOR/INDICATOR

Jerry H. Batcheler, 1364 Keoncrest Ave., San Jose, Calif. 95110, and Raymond G. Marek, 1242 Willo Mar Dr., San Jose, Calif. 95125

Filed May 18, 1983, Ser. No. 495,667
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—604 **15 Claims**



1. An automatic continuously monitoring soil moisture monitor/indicator comprising a circuit containing:

a. outputs connected to an internal means for alternately pulsing external probes in equal and opposite voltage polarities,

b. means for pulsing a specific voltage across said probe connection output during either polarity sampling cycle,

c. an output means connected to a capacitor whereby said capacitor integrates for sampling rate and duration time,

d. means for yielding absolute value of current from said probes to an output connection such that said current from said probes proportionately appears at said output connection for attachment to a user adjustment potentiometer,

e. means for voltage comparison yielding "on" or "off" result from said voltage comparison, where said voltage comparison is a function of the ratio of soil moisture dependent resistance and said user adjustment potentiometer resistance,

f. means for latching and holding "on" or "off" condition at end of sampling period, and

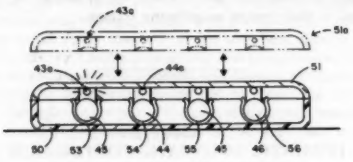
g. means of turning on an output indicating device through output connection if latched condition is "on" during sampling period.

4,514,723

METHOD AND APPARATUS FOR DEPICTING INOPERATIVE ELECTRICAL FUSES

David T. Leal, P.O. Box 14227, South Lake Tahoe, Calif. 95702

Filed Apr. 14, 1983, Ser. No. 484,915
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—638 1 Claim



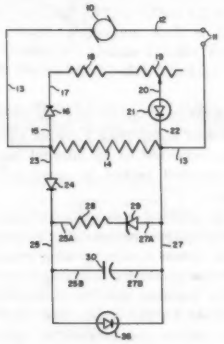
1. An automobile fuse bank holder comprising in combination a base in the form of a box open on its top side, said base containing a plurality of clip type fuse holders wherein each fuse holder comprises two end clips suitable to clip upon the ends of an elongated automotive type fuse; a cover means detachably mounted upon said base, wherein said cover means has a plurality of light emitting diode contact means so positioned therein that in pairs said light emitting diode contact means will contact, in cooperative pairs, the ends of fuses inserted within said pairs of clip means when the same are holding fuses; light emitting diode means inserted in electrical contact configuration between the pairs of light emitting diode contact means; and viewing means associated with each light emitting diode means in said cover means in such manner that each light emitting diode means is visible through said cover.

4,514,724

ELECTRICAL WARNING SYSTEM FOR MALFUNCTIONS IN REFRIGERATION

Walter J. Valentine, Bellmore, N.Y., assignor to Paul W. Garbo, Freeport, N.Y., a part interest

Filed Sep. 28, 1982, Ser. No. 425,874
Int. Cl.[3] G08B 21/00
U.S. Cl. 340—648 8 Claims



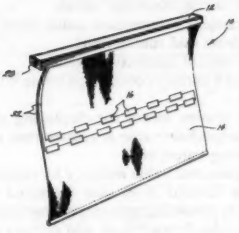
1. An electrical warning system for malfunctions in refrigeration equipment driven by an alternating current motor, which comprises a main resistor connected in series with said motor and selected to cause a voltage drop in the power supplied to said motor not exceeding 5 volts, a high amp shunt connected in parallel to said main resistor comprising a first diode, a first resistor and a first light-emitting diode, all connected in series, and a low amp shunt connected in parallel to said main resistor comprising a second diode and a second light-emitting diode connected in series, with a capacitor connected in parallel to said second light-emitting diode, and with a second resistor and zener diode connected in series to each other and together connected in parallel to said second light-emitting diode.

4,514,725

WINDOW SHADE MOUNTED ALARM SYSTEM

Barbara E. Bristley, 1100 Ball St., Fremont, Ohio 43420

Filed Dec. 20, 1982, Ser. No. 451,013
Int. Cl.[3] G08B 7/00, 23/00
U.S. Cl. 340—691 16 Claims



1. An alarm system comprising:

a window shade assembly mounted in a window of a structure including a retractable window shade attached to a rotatable shaft;

display means mounted on one side of said window shade and facing outwardly of the structure for selectively producing an illuminated visual alarm signal in response to an activating signal;

emergency condition detector means located within the structure for detecting an emergency condition therein and for generating an audible signal in response thereto; and

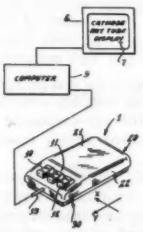
means independent of the shade position and responsive to said audible signal for generating said activating signal to cause said display means to produce said illuminated visual alarm signal.

4,514,726

NOISE MOUSE

Albert L. Whetstone, Milford; Kerry L. Shaklee, Fairfield, and Khosrow Modjallal, Killingworth, all of Conn., assignors to Display Interface Corporation, Milford, Conn.

Filed Aug. 19, 1983, Ser. No. 524,924
Int. Cl.[3] G09G 1/00
U.S. Cl. 340—710 31 Claims



26. A cursor controller for controlling movement of a cursor dot or the like on a computer display in accordance with movement of the cursor controller, the cursor controller comprising:

(A) a housing adapted for sliding motion on a work surface, said sliding motion producing noise;

(B) means for determining the direction of motion of housing;

(C) a microphone mounted in the housing and responsive to the noise generated by sliding motion, said noise output of the microphone being a function of the velocity and therefore also of the distance of motion; whereby control signals corresponding to the distance of motion can be drived from the microphone signal.

4,514,727

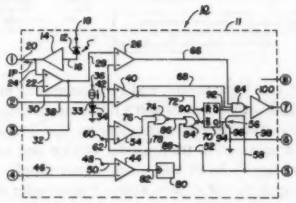
AUTOMATIC BRIGHTNESS CONTROL APPARATUS

Joel C. Van Antwerp, Frisco, Tex., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 28, 1982, Ser. No. 392,675

Int. Cl.³ G09G 3/00

U.S. Cl. 340—793 **5 Claims**



1. Apparatus for receiving voltage from a power supply and for producing a periodic electrical output signal whose average value is proportional to the ambient light level and independent of fluctuations in the power supply voltage, comprising:

a photosensor circuit for producing an electrical signal proportional to the ambient light level and substantially independent of the power supply voltage;

a ramp oscillator circuit for producing a periodic electrical signal having a ramp waveform whose amplitude is proportional to the power supply voltage; and

an output circuit for comparing the photosensor signal to the ramp signal and producing a periodic output signal whose duty cycle is the portion of time the photosensor signal exceeds the ramp signal.

4,514,728

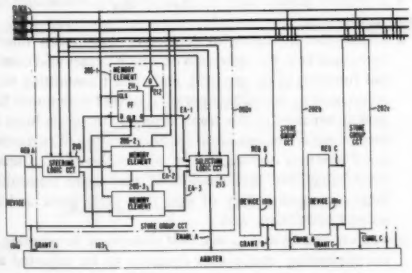
STORE GROUP BUS ALLOCATION SYSTEM

Sudhir R. Ahuja, Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 124,426, Feb. 25, 1980, Pat. No. 4,384,323. This application Dec. 27, 1982, Ser. No. 453,624

Int. Cl.³ G06F 9/46, 9/00

U.S. Cl. 340—825.5 **1 Claim**



1. A store group resource allocation arrangement distributed among a plurality of devices for systematically controlling access of the devices to a common resource, the arrangement including means (**101***a*), included in each of said devices, for generating a request signal (REQA), store group circuit means (**102**), associated with each of said devices, responsive to the request signal for storing the request signal and for generating an arbitration enabling signal (ENABLA), and an arbiter (**103**) responsive to the arbitration enabling signal for generating a corresponding access grant signal (GRANTA) according to a prescribed criterion, the arrangement characterized by,

a source of a clock signal having first and second states,

the store group circuit means being responsive also to the clock signal for generating the arbitration enabling signal at a particular time instant corresponding to the coincidence of the presence of the request signal and the clock signal changing from the first state to the second state,

means (**110**), associated with each of said devices, responsive to the arbitration enabling signal from the store group circuit means associated with each device of the plurality of said devices for temporarily inhibiting storage of a later generated request signal by each store group circuit means, and

the store group circuit means being responsive to the access grant signal for disabling generation of the corresponding arbitration enabling signal.

4,514,729

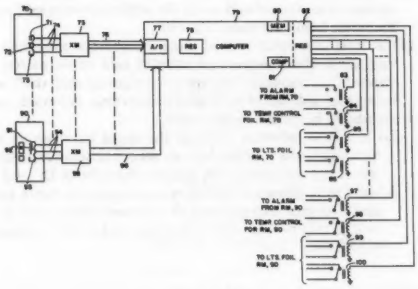
ENVIRONMENTAL CONTROL SYSTEM AND METHOD

Jay R. Szarka, 11 Orchard St., Milford, N.H. 03055

Filed Aug. 16, 1982, Ser. No. 408,255

Int. Cl.³ H04Q 9/00; G08B 1/08

U.S. Cl. 340—825.06 **7 Claims**



1. A system for controlling the environment of one or more rooms comprising:

a sensor for each room for sensing the presence or absence of a person in the room;

means for sensing environmental parameters including temperature for each room;

means for transmitting the sensed presence or absence and the parameters as signals;

a digital computer responsive to the transmitted signals, and having a memory;

information stored in the memory establishing upper and lower sensor signal limits for the temperature and time interval signals for said limits and for the authorized and unauthorized presence or absence in the room;

said computer comprising means for comparing the received temperature signals with the stored upper and lower sensor limit signals and with the authorized time interval signal and the presence or absence signals with the time interval signals; and

means for controlling the temperature to one limit during authorized time intervals and to the other limit during unauthorized time intervals in response to the temperature comparisons in each room and for actuating an alarm in

response to a sensed presence of a person during an established unauthorized presence time interval.

4,514,730
PIPELINE MONITORING APPARATUS

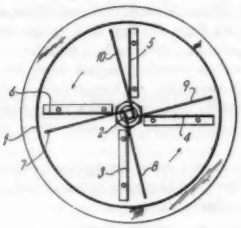
Paul T. Ming, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Dec. 20, 1982, Ser. No. 451,594

Claims priority, application United Kingdom, Dec. 23, 1981, 8138834

Int. Cl.³ G08B *5/24*

U.S. Cl. 340—815.26 **7 Claims**



1. Apparatus for displaying the presence or absence of a change from the normal to abnormal in the condition of a pipeline comprising at least two pairs of vanes mounted around and extending outwardly from a substantially upright shaft, wherein

(i) at least one pair of vane members is mounted immovably on opposite sides of said shaft, the angle between said vane members being substantially 180°,

(ii) at least one other pair of vane members is mounted on said shaft, the members of each of said other pair(s) of vanes being mounted on opposite sides of said shaft and being movable relative to said immovably mounted vane members, in such a manner that,

(a) in a first (normal) position the angle between an immovable vane member and an adjacent relatively movable vane member is not greater than about 15° and

(b) said movable vane members are adapted to move from said first (normal) position to a second (abnormal) position so that in said second position said angle is substantially zero.

4,514,731
CODED INFORMATION ARRANGEMENT

John B. Falck, 111 St. George's Dr., London SW1, and David Robson, 8 Conyers Way, Great Barton, Suffolk, IP31 2RL, both of England

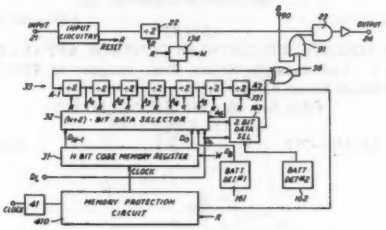
Filed Jul. 14, 1982, Ser. No. 398,276

Claims priority, application United Kingdom, Jul. 14, 1981, 8121640

Int. Cl.³ H04Q *9/00*; **G08B** *29/00*

U.S. Cl. 340—825.08 **9 Claims**

9. A coded information system comprising an active transponder device having first and second input circuits, a frequency division circuit connected to said first input circuit, a memory for storing and supplying coded information and having a coding input, a clock input and an output, a transmitter, said transmitter having an input, and means for connecting said output of said memory to said input of said transmitter, said transmitter being arranged to transmit an output signal including said coded information, said second input circuit being connected to said clock input of said memory, an output from an intermediate part of said frequency division circuit being connected to said coding input of said memory, and a memory protection circuit for preventing undesired changing of the coded information stored in said memory, said memory protection circuit being connected to said second input circuit and comprising logic means connected to selected points of said frequency division circuit, and said memory protection circuit further comprising means for comparing both the number and the timing of pulses actually applied to aid second input circuit with the number and the timing of a predetermined series of pulses, said predetermined series being determined by said logic means, and a programming unit comprising clock signal supply means and a frequency division means, said frequency division means duplicating said frequency division circuit of said active transponder device and controlling the timing of signals from said clock signal supply means to said second input circuit of said active transponder device.



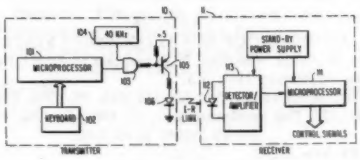
4,514,732
TECHNIQUE FOR INCREASING BATTERY LIFE IN REMOTE CONTROL TRANSMITTERS

John J. Hayes, Jr., Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Aug. 23, 1982, Ser. No. 410,200

Int. Cl.³ H04B *9/00*; **H04Q** *9/00*

U.S. Cl. 340—825.57 **7 Claims**



1. A remote control system for controlling continuous functions comprising:

a transmitter including at least one continuous function command key, the operation of which causes said continuous function to be adjusted, and code transmitting means responsive to the initial operation of said continuous function command key for transmitting a first code burst and responsive to the cessation of the operation of said continuous function command key for transmitting a second code burst, the transmission of said code transmitting means consisting only of said first code burst and said second code burst, and

a receiver responsive to said first code burst for causing the corresponding continuous function to be adjusted at a predetermined rate and responsive to said second code burst for causing the adjustment of said continuous function to cease.

4,514,733
CONTROL SYSTEM FOR AIRCRAFT

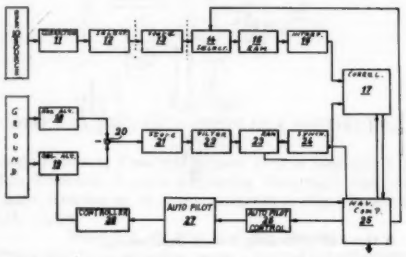
Hubertus Schmidtlein, Achim, and Horst-Dieter Lerche, Stuhr, both of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke, Bremen, Fed. Rep. of Germany

Continuation of Ser. No. 834,008, Sep. 13, 1977, abandoned. This application Feb. 19, 1982, Ser. No. 350,261

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641447

Int. Cl.³ G01S *13/00*

U.S. Cl. 343—5 MM **1 Claim**



1. A method of automatically navigating an aircraft across a particular territory on the basis of topographical reference data to be compared with actual topographical data acquired by the aircraft during overflight across the particular territory, comprising the steps of:

acquiring prior to said overflight topographic reference data under conditions which include systematic errors introduced by a specific altitute measuring device, the reference data used are regular topographic data, and the systematic errors are introduced by providing terrain-specific corrective data by means of said specific altitude-measuring device;

acquiring the actual topographic position data under utilization of the same type of specific altitude-measuring device which introduces similar errors; and using these reference data together with the topographic position data to obtain said comparison, including correcting the reference data by introducing systematic errors on the basis of the corrective data.

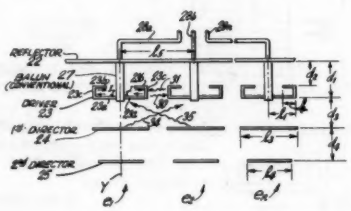
4,514,734
ARRAY ANTENNA SYSTEM WITH LOW COUPLING ELEMENTS

Justine D. Cermignani, Fort Salonga, and Frederick M. Ganz, Nesconset, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 149,019, May 12, 1980, abandoned, which is a continuation of Ser. No. 929,322, Jul. 31, 1978, abandoned. This application Feb. 23, 1983, Ser. No. 468,878

Int. Cl.³ H01Q *1/28, 21/08*

U.S. Cl. 343—708 **25 Claims**



1. In a scannable antenna array for the transmission and/or reception of energy of wavelength λ, having a mutually spaced plurality of endfired Yagi elements each comprising a reflector, a driver and at least one director spaced forwardly therefrom, the improvement wherein:

said driver is a dipole radiator including a pair of radiating conductors each having a forward radiating segment generally perpendicular to the Yagi axis and an inwardly turned end segment behind said forward segment and parallel thereto so that the tips of said pair of radiating conductors are mutually facing, whereby radiation from the tips of said end segments tends to cancel and whereby radiation from said radiating conductors tends to be concentrated near the axis of said driver thereby to reduce radiation coupled from said driver to adjacent elements of the array,

the drivers of said mutually spaced elements being disposed such that the forwardly radiating segments are substantially colinear,

said Yagi elements being spaced and dimensioned to produce an in-array E-plane directional pattern having a half-power beamwidth of at least ±45° and minimum gain at about ±90°, relative to said axis.

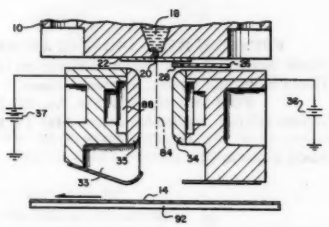
4,514,735
INK JET PRINTER START-UP AND SHUTDOWN

David E. Jones, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 12, 1983, Ser. No. 522,954

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **14 Claims**



11. In an ink jet printer including a print head for producing at least one jet drop stream, charge electrode means for inducing electrical charges on the drops formed in said jet drop stream, a catcher positioned to one side of the jet drop stream for catching drops deflected thereto, and deflection field means for producing an electrical deflection field in the region between said print head and said catcher, said field extending in a direction such that drops carrying a charge of a first polarity are deflected toward said catcher means, the method of printer shutdown, comprising:

producing an electrical deflection field having a non-zero potential in the region adjacent said print head, while shielding the jet drop stream with said charge electrode means in the region of drop formation from said deflection field,

charging drops formed in said jet drop stream to a charge level of said first polarity by said charge electrode means,

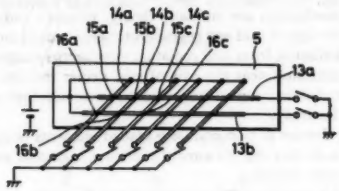
retracting said charge electrode means from its normal operating position to expose the drops then being formed to said electrical deflection field, whereby said drops are charged to a charge of a first polarity by said electrical deflection field and therefore are deflected to said catcher, and

terminating jet drop stream formation.

4,514,736
THERMAL HEAD

Haruhiko Moriguchi, and Toshiharu Inui, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,711
Claims priority, application Japan, Jan. 13, 1982, 57-2686
Int. Cl.[3] H05B *1/100*
U.S. Cl. 346—76 PH 2 Claims



1. A thermal head comprising,

first bar-shaped heat generating resistors arranged in a first plane in a manner so as to be substantially parallel to one another; and

second bar-shaped heat generating resistors arranged in a second plane parallel to said first plane and disposed in a manner so as to be substantially parallel to one another;

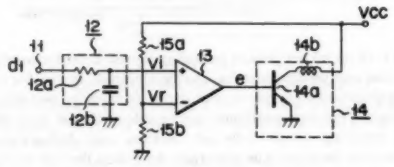
said first bar-shaped heat generating resistors crossing over said second bar-shaped heat generating resistors to provide heat generating dots at the crossing points;

wherein said first and second bar-shaped resistors cross obliquely, such that crossing points of one line are offset from crossing points of an adjacent line.

4,514,737
PRINTING HEAD DRIVING APPARATUS

Kuniaki Suzuki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 10, 1983, Ser. No. 493,275
Claims priority, application Japan, May 13, 1982, 57-80519
Int. Cl.[3] G01D *15/10*
U.S. Cl. 346—76 PH 9 Claims



1. A printing head driving apparatus comprising:

input voltage signal generating means for generating an input voltage signal having a predetermined rise time or a predetermined fall time in synchronism with a print timing signal generated when a printing head is driven;

reference voltage signal generating means for generating a reference voltage signal of a varying level corresponding to a variation of a power source voltage for driving the printing head;

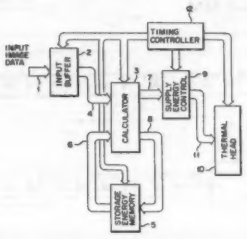
driving pulse signal outputting means for comparing the level of said input voltage signal and the level of said reference voltage signal to produce a driving pulse signal having a pulse generation timing and pulse width corresponding to the variation of the power source voltage; and

driving means for driving the printing head on the basis of the driving pulse signal which is output from the driving pulse signal outputting means.

4,514,738
THERMAL RECORDING SYSTEM

Hitoshi Nagato; Koji Izawa, and Shuzo Hirahara, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 22, 1983, Ser. No. 554,300
Claims priority, application Japan, Nov. 22, 1982, 57-207710
Int. Cl.[3] G01D *15/10*
U.S. Cl. 346—76 PH 12 Claims



1. A thermal recording system comprising:

a thermal head having a number of thermal heating resistive elements and drive circuit means for selectively energizing said thermal heating resistive elements, with current supply, in accordance with image data to record the image data;

memory means for storing data of a storage energy of each of said thermal heating resistive elements after the image data have been recorded;

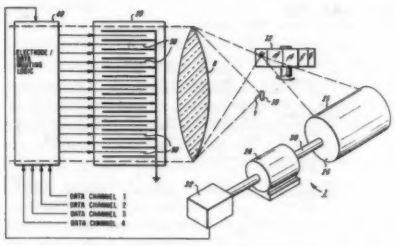
calculating means responsive to storage energy data from said memory means and next image data for calculating supply energy to be supplied to each of said resistive elements to record the next image data and a storage energy stored in each of said thermal heating resistive elements after the next image data have been recorded; and

controlling means responsive to the supply energy data of each of said resistive elements from said calculating means for causing said drive circuit means to control the supply energy to be applied to each of said thermal heating resistive elements.

4,514,739
CROSS SCAN BEAM POSITIONER FOR MULTIPLE CHANNEL LASER ROS

Richard V. Johnson, Pasadena, and William D. Turner, San Marino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1983, Ser. No. 548,061
Int. Cl.[3] G01D *9/42*; G02F *1/01*; H04N *3/08*
U.S. Cl. 346—108 3 Claims



1. A light scanning system capable of simultaneously scanning light modulated in accordance with multiple data chan-

nels across multiple lines of a photosensitive surface which surface may have position errors including:

a total internal reflection modulator having a number of addressable electrodes greater than the collective number of addressable electrodes needed to provide the desired pixel resolution for all of the simultaneously scanned lines,

means for developing an error signal indicative of any positional error of said photosensitive surface, and

means responsive to said error signal for applying data channel drive signals to different ones of said electrodes depending upon the value of said error signal.

4,514,740

SHEET GUIDE MECHANISM IN A RECORDING DEVICE

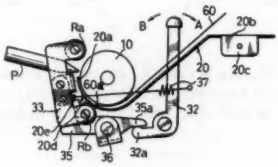
Mitsugu Fujiwara; Yoshinori Sakaue, both of Morioka; Tomio Aso, Kitakami; Koshiro Kurokawa, Hanamaki, and Hideo Obara, Ezuriko, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 17, 1983, Ser. No. 505,202

Claims priority, application Japan, Jun. 19, 1982, 57-91802[U]

Int. Cl.³ G01D *15/16;* **B41J** *3/04*

U.S. Cl. 346—139 R **4 Claims**



1. A sheet guide mechanism in a recording device including a rotatable platen having an inlet side for a recording sheet, a recording member opposed to a recording side of the platen, and pressure rollers adapted to come into pressure contact with said platen for pressing down a recording sheet, wherein said guide mechanism comprises a guide plate extending from said inlet side to a lower portion of said recording side of said platen below said platen, said guide plate having windows formed therein for bringing said pressure rollers into contact with said platen and recording sheet, and guide pieces formed on forward edges of said windows for guiding the recording sheet around said platen in a sheet inserting direction of said windows, said guide pieces being bent in a direction away from said platen.

4,514,741

THERMAL INK JET PRINTER UTILIZING A PRINTHEAD RESISTOR HAVING A CENTRAL COLD SPOT

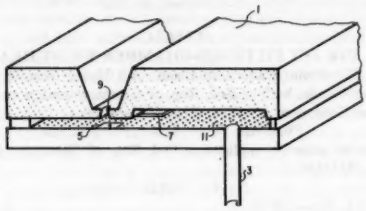
John D. Meyer, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1982, Ser. No. 443,711

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **16 Claims**

1. A thermal ink jet printer, responsive to a control signal, for ejecting an ink droplet from a capillary region, the thermal ink jet printer comprising a printhead resistor in thermal contact with the capillary region for receiving the control signal, the printhead resistor being composed of a resistive



region and a conductive region located within said resistive region and electrically connected thereto.

4,514,742

PRINTER HEAD FOR AN INK-ON-DEMAND TYPE INK-JET PRINTER

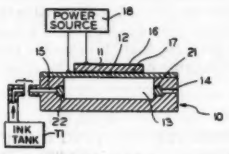
Michihisa Suga, and Mitsuo Tsuzuki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 274,210, Jun. 16, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,088

Claims priority, application Japan, Jun. 16, 1980, 55-81184; Nov. 21, 1980, 55-164343

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **3 Claims**



1. A printer head for an ink-on-demand type ink-jet printer for squirting ink droplets onto a printing medium, said printer head comprising:

an ink chamber filled with ink;

a nozzle for squirting said ink droplets;

an ink supply passageway extending from an ink tank to said ink chamber;

an ink delivery passageway extending from said ink chamber to said nozzle;

ink supplying pressure means responsive to an electrical signal for exerting a pressure on said ink in said ink chamber in order to squirt said ink droplets;

one-way fluid control means disposed in both said supply and delivery passageways and having a peripherally clamped elastic and deformable flat member and a valve seat, said deformable member resting on said valve seat and forming at least one open portion through which ink may flow, said open portion being opened and closed by deformation of said deformable member, said deformable member being deformed solely in response to the on demand ink supplying pressure means responding to sdid electrical signal in order to pass said ink in said one-way therethrough, at least one of said deformable member and said valve seat being a solid central disc connected by spokes to the periphery thereof; and

the other of said deformable member and said valve seat being a solid ring shaped member with a center hole positioned over said central disc, whereby said open portion extends through space between said spokes and said center hole, and further whereby the flow resistance may become low under the action of the pressure of the ink in

response to the ink stream flow in the direction from the supply side toward the nozzle side and the flow resistance may become high in the opposite direction.

4,514,743

INK JET FILTERED-CHAMBER PRINT HEAD

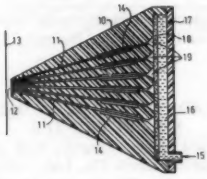
Rolf Röschlein, Paderborn-Elsen, and Heinz Schulte, Paderborn-Sande, both of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,509

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313156

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **6 Claims**



1. Piezoelectrically driven print head for dot matrix ink printers with a plurality of print jets in the form of ink ducts receiving the printing fluid, which ducts are respectively enclosed by a piezoelectric drive element and are connected by way of a filter arrangement with an ink chamber common to them, wherein the ink ducts have a substantially greater length than the drive elements, characterized in that the filter arrangement consists of only a layer (**18**) of a capillary filter material and in that each ink duct (**11**) shows a funnel-shaped enlargement (**19**) bordering directly on this layer (**18**).

4,514,744

ELECTROSTATIC COPYING DEVICE EMPLOYING THERMALLY FLUIDIZABLE MEDIUM ON PHOTOSENSITIVE BELT

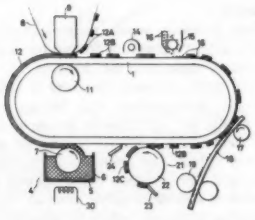
Hiroyuki Saitoh, and Yoshiki Kikuchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,119

Claims priority, application Japan, Sep. 24, 1982, 57-164919; Sep. 24, 1982, 57-164920

Int. Cl.³ G01D *15/06, 15/12*

U.S. Cl. 346—153.1 **12 Claims**



1. A recording device comprising: a photosensitive belt capable of producing electromotive force upon irradiation with light, said photosensitive belt having on one surface thereof a light-shielding layer of a material capable of being fluidized or sublimated by heating; light-shielding image forming means for selectively heating said light-shielding layer and removing heated portions of said light-shielding layer from said photosensitive belt to form a light-shielding image thereon; latent image forming means for exposing said photosensitive belt carrying said light-shielding image to form a latent image on said photosensitive belt; developing means for developing said latent image with toner particles to form a toner image; image transfer means for transferring said toner image to a paper sheet; and fixing means for fixing said toner image to said paper sheet.

4,514,745

HEAT-SENSITIVE RECORDING MATERIAL

Toshitake Suzuki, Hyogo; Naoto Arai, Osaka; Shoji Aoyagi, Hyogo; Toranosuke Saito, Osaka; Masakatsu Kitani, Hyogo, and Takashi Ishibashi, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co. Ltd. and Sanko Kaihatsu Kagaku Kenkyusho Corporation, both of, Japan

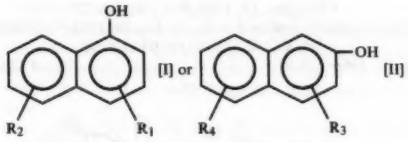
Filed Jul. 30, 1984, Ser. No. 635,580

Claims priority, application Japan, Aug. 23, 1983, 58-154379

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—216 **3 Claims**

1. In a heat-sensitive recording material incorporating a colorless or pale-colored basic dye and a color acceptor which is reactive with the dye to form a color when contacted therewith, the recording material characterized in that the color acceptor comprises at least one compound represented by the formula



wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, alkyl having 1 to 8 carbon atoms, aryl or aralkyl, provided that R_1 and R_2, as well as R_3 and R_4, are not hydrogen at the same time.

4,514,746

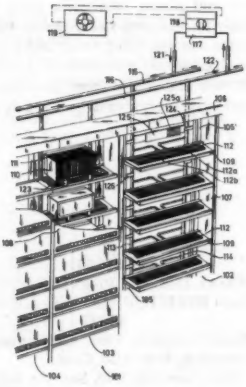
APPARATUS FOR COOLING TELECOMMUNICATIONS EQUIPMENT IN A RACK

Gösta B. Lindqvist, Johanneshov, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Dec. 1, 1983, Ser. No. 445,983

Int. Cl.³ H05H *7/20*

U.S. Cl. 361—385 **13 Claims**



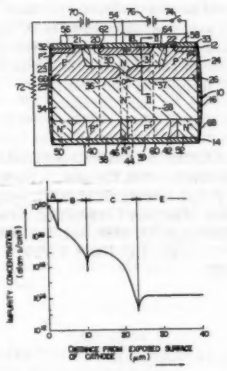
1. Apparatus in a work space cooling telecommunications equipment consisting of component-carrying printed circuit boards arranged in board magazines, comprising a rack having shelves arranged on top of one another in said rack at least one shelf having an individual heat exchanger which incorporates

cooling flanges and at least one tubular coil, a cooler having lines connected to the heat exchanger to cause a coolant to run in the tubular coil; the heat exchanger, viewed in the horizontal plane of its shelf extending along at least one half the length of the shelf; and at least one heat-transfer member having extensive heat-conducting metallic contact surfaces arranged to contact the board magazine and mounted in heat-transfer relation to the associated shelf as well as the heat exchanger; at least a part of said heat-transfer member supporting said magazine to assure heat transfer from said magazine to said member, so that said heat exchanger and cooler contribute towards removing the heat given off by the telecommunications equipment by means of heat conduction through said extensive contact surfaces, independent of packing density of the aforesaid telecommunications equipment in the rack and the rate of heat emission.

4,514,747
FIELD CONTROLLED THYRISTOR WITH DOUBLE-DIFFUSED SOURCE REGION

Kenji Miyata; Yoshio Terasawa, both of Katsuta; Saburo Oikawa, Hitachi; Susumu Murakami, Hitachi, and Masahiro Okamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 63,476, Aug. 3, 1979, abandoned. This application Mar. 12, 1982, Ser. No. 357,594
Claims priority, application Japan, Aug. 7, 1978, 53-95474
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **12 Claims**



1. A field controlled thrystor comprising:

(a) a semiconductor substrate having a first and a second main surface opposed to each other, said semiconductor substrate including

(a1) a first semiconductor region of one conductivity type exposed in a portion of said first main surface,

(a2) a second semiconductor region of said one conductivity type adjacent to said first semiconductor region and having a lower impurity concentration than said first region,

(a3) gate regions of the other conductivity type adjacent to said second region and forming first P-N junctions with said second region, each of said gate regions including a surface-exposed region exposed in said first main surface and a third semiconductor region laterally extending and connected with said surface-exposed region, and said third region being spaced from the adjacent third region by a spacing D which is located in the area of projection of said first region upon said second main surface,

(a4) a fourth semiconductor region of said one conductivity type adjacent to said third regions and having a lower impurity concentration than said second region, said fourth region forming second P-N junctions with said third regions, and

(a5) fifth semiconductor regions of said other conductivity type adjacent to said fourth region and exposed in said second main surface, said fifth region forming third P-N junctions with said fourth region,

wherein the impurity concentration in said second region has a gradient of decrease from said first region toward said third regions so that the impurity concentration in said second region adjacent to said first region is greater than the impurity concentration in said second region adjacent to said third region and and so that the impurity concentration continuously decreases in the second region from the point of adjacency with the first region to the point of adjacency with the third regions, said third semiconductor region being a diffused region in said fourth semiconductor region diffused from said first main surface, said second semiconductor region being a diffused region in said gate regions and fourth semiconductor region diffused from said first main surface to invert a portion of said gate regions to form said second semiconductor region and to bury said third semiconductor region, said first semiconductor region being a diffused region in said second semiconductor region diffused from said first main surface and said third semiconductor region being sandwiched between said second and fourth semiconductor regions;

(b) a cathode electrode kept in ohmic contact with said first region exposed in said first main surface;

(c) an anode electrode kept in ohmic contact with said fifth regions exposed in said second main surface; and

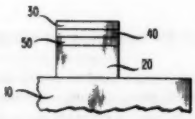
(d) gate electrodes kept in ohmic contact with said surface-exposed regions exposed in said first main surface,

wherein said decreasing net impurity concentration in said second region is set so that said second region will have a low impurity concentration at a portion thereof in contact with said buried third semiconductor region of said gate regions to provide a high reverse blocking voltage for said field controlled thyristor and so that said second region will have a high impurity concentration at a portion thereof in contact with said first semiconductor region to provide a low forward voltage drop for said field controlled thyristor.

4,514,748
GERMANIUM P-I-N PHOTODETECTOR ON SILICON SUBSTRATE

John C. Bean, New Providence; Alexander Kastalsky, North Plainfield, and Sergey Luryi, Millington, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 21, 1983, Ser. No. 554,061
Int. Cl.³ H01L *29/12*
U.S. Cl. 357—58 **6 Claims**



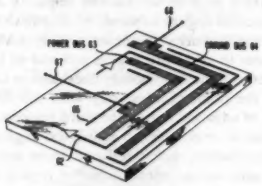
1. A device comprising (1) a substrate comprising silicon that includes semiconductor devices and (2) a photonic component that produces a current when stimulated by electromagnetic radiation characterized in that

said photonic component comprises a germanium based p-i-n diode, including an intrinsic portion, a p-type portion, and an n-type portion, that is electrically and physically connected to said substrate by an intermediary region, said intermediary region limiting the average spacing of the crystal dislocations propagating through said intrinsic portion to greater than 1000 Angstroms.

4,514,749
VLSI CHIP WITH GROUND SHIELDING

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 18, 1983, Ser. No. 458,769
Int. Cl.³ H01L 23/48
U.S. Cl. 357—68 4 Claims

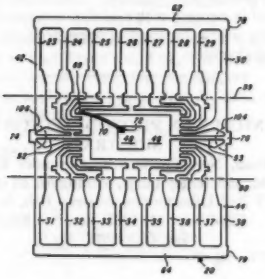


1. An integrated circuit chip having a wiring section including at least one clock distribution line and at least a first signal line, said wiring section including first and second lines adjacent to first and second sides of said clock distribution line, each of said first and second lines being adapted to be maintained at a fixed d-c potential for isolating said clock distribution line from said first signal line.

4,514,750
INTEGRATED CIRCUIT PACKAGE HAVING INTERCONNECTED LEADS ADJACENT THE PACKAGE ENDS

Anthony L. Adams, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 11, 1982, Ser. No. 338,754
Int. Cl.³ H01L 23/48, 23/12
U.S. Cl. 357—70 2 Claims



1. A package for containing an integrated circuit device, comprising:

an enclosure having a central cavity for receiving the integrated circuit device, said enclosure having a pair of opposite ends having recesses and a pair of opposite sides; and

a leadframe having a central bar pad for carrying said integrated circuit device and a plurality of leads having first and second ends,

the bond pad and the first ends of the leads being located within the cavity of said enclosure,

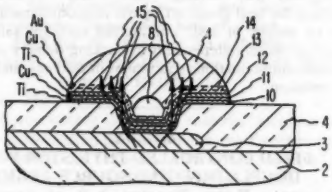
the second ends of the leads being located outside of said enclosure, forming first and second lead sets of parallel leads projecting from opposite sides of said enclosure,

the leads of said leadframe having leads closest to said ends of said enclosure which are interconnected within the recesses of the ends of said enclosure.

4,514,751
COMPRESSIVELY STRESSES TITANIUM METALLURGY FOR CONTACTING PASSIVATED SEMICONDUCTOR DEVICES

Somnath Bhattacharya, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,542
Int. Cl.³ H01L 23/48, 29/46
U.S. Cl. 357—71 11 Claims



1. Contact metallurgy for an integrated semiconductor substrate having circuit elements therein, comprising:

a dielectric coating on said substrate having an aperture therethrough for electrical connection to a said element in said substrate;

a contact pad comprising

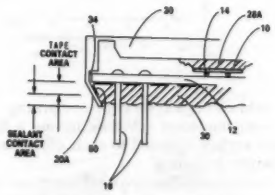
a first layer of compressively stressed titanium covering said aperture and having peripheral portions extending on and bonded to said coating externally of said aperture, with said titanium having oxygen dispersed therein, and

a second layer of solder bondable contact metallurgy concentrically formed on said first layer.

4,514,752
DISPLACEMENT COMPENSATING MODULE

Peter A. Engel, Binghamton; Douglas H. Strope, Apalachin, and Thomas E. Wray, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,631
Int. Cl.³ H01L 23/10
U.S. Cl. 357—72 6 Claims



1. An electronic module, comprising:

a substrate including a back surface and an edge;

a cap disposed over the top surface of said substrate, the cap having an inner surface, the boundaries of a gap being defined by the edge of said substrate and said inner surface of said cap;

a sealant disposed over the back surface of said substrate; and

holding means disposed between said sealant on one side and the back surface of said substrate coupled with the inner surface of said cap on the other side for holding said sealant external to said gap and preventing said sealant from being disposed therein.

4. A method of manufacturing an electronic module, said module including a substrate, comprising the steps of:

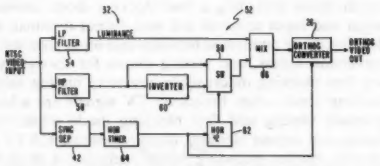
covering and enclosing said substrate with a cap, a gap

traversing the perimeter of said substrate being defined by the edge of said substrate and the inner surface of said cap;
securing a blocking means to the back side of said substrate and to the inner surface of said cap so as to cover said gap; and
applying a sealant composition to the back side of said substrate until the sealant composition at least partially covers said blocking means.

4,514,753
SPECTRUM CONSERVATION IN ENCODED COLOR TV SIGNALS

Glen R. Southworth, Boulder, and Bruce F. Johnson, Longmont, both of Colo., assignors to Colorado Video, Incorporated, Boulder, Colo.

Filed Nov. 3, 1982, Ser. No. 438,679
Int. Cl.³ H04N 9/493
U.S. Cl. 358—11 **23 Claims**

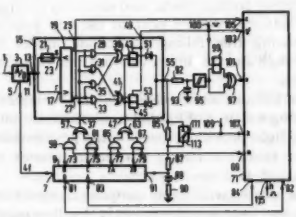


11. A device for spectrum conservation of an encoded color TV signal, said device comprising:
input means for receiving an encoded color TV signal having a high frequency color subcarrier component;
orthogonal encoding means connected with said input means for re-encoding said color TV signal, said orthogonal encoding means including means for eliminating said high frequency color subcarrier component;
transfer means for receiving said re-encoded signal from said orthogonal encoding means and transferring the same by one of transmission and recording; and
orthogonal decoding means connected with said transfer means for receiving said re-encoded signal therefrom, said orthogonal decoding means including means for restoring said high frequency color subcarrier component into said color TV signal.

4,514,754
DIGITAL COLOR TELEVISION SIGNAL PROCESSING CIRCUIT

Antonius H. H. J. Nillesen, and Petrus W. G. Welles, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1983, Ser. No. 469,545
Claims priority, application Netherlands, Mar. 5, 1982, 8200901
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 **6 Claims**

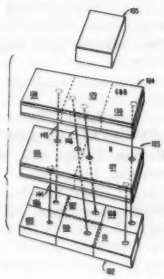


1. A digital colour television signal processing circuit comprising an analogue-to-digital converter which is controlled by a pulse generator producing a pulse signal of four times the chrominance subcarrier frequency, a comparison circuit being coupled to the output of the analogue-to-digital converter for comparing different digital burst samples and for obtaining therefrom a control signal for a phase control loop of the pulse generator, characterised in that the burst samples to be compared are obtained from an input (17) and an output (23) of a delay circuit having such a delay that at a correct pulse generator phase the difference between the burst samples at the input (17) and at the output (23) thereof becomes zero, while the comparison circuit is an inequality detection circuit (15) for detecting independently of the amplitude value of the burst samples inequality of the amplitude value of the burst samples at the input and the output of the delay circuit and converting that inequality, if present, into a control signal (at 91).

4,514,755
SOLID-STATE COLOR IMAGER WITH TWO LAYER THREE STORY STRUCTURE

Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 512,051, Jul. 8, 1983, Pat. No. 4,443,813, which is a continuation-in-part of Ser. No. 330,921, Dec. 15, 1981, abandoned. This application Mar. 6, 1984, Ser. No. 559,074
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 **12 Claims**

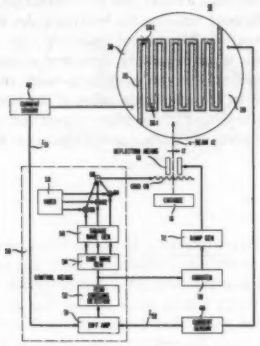


1. A solid state imager, comprising:
a plurality of switching elements;
a first photosensitive layer sensitive to and absorptive of at least a first color and providing a first output;
means for coupling said first output to a first of said switching elements;
a second photosensitive layer receiving light through said first photosensitive layer, said second photosensitive layer having first and second portions and being sensitive to at least second and third colors different from said first color, and providing second and third outputs from said first and second portions, respectively;
means for coupling said second and third outputs to a second and a third of said switching elements respectively; and
a monocolor filter disposed over said second portion of said second photosensitive layer for blocking said second color whereby said third output is responsive to said third color.

4,514,756
SINGLE BEAM COLOR CRT

Stuart L. Blank, Madison, and Eugene I. Gordon, Convent Station, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 22, 1983, Ser. No. 468,502
Int. Cl.³ H04N *9/22, 9/27*
U.S. Cl. 358—66 **6 Claims**



1. Color CRT apparatus comprising

a target including a plurality of triads each including three adjacent stripes of material for generating primary colors of light when excited by an e-beam, and

means for scanning a single e-beam across the triads to generate said light, characterized by

adjacent stripes of each of said triads having a staircase geometry,

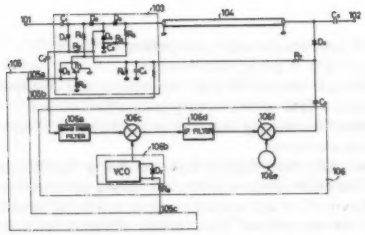
a pair of interdigitated electrodes having fingers each of which overlays and contacts three adjacent stripes of separate ones of said triads, said beam generating trains of current pulses from said electrodes, and

control means responsive to said current pulse trains for modulating said e-beam so as to modulate the intensity of said light.

4,514,757
CATV SELECTION DEVICE

Tasuku Noji, and Katsumi Tobita, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 2, 1981, Ser. No. 279,689
Claims priority, application Japan, Jul. 3, 1980, 55-91033
Int. Cl.³ H04N *7/16, 5/782*
U.S. Cl. 358—86 **4 Claims**

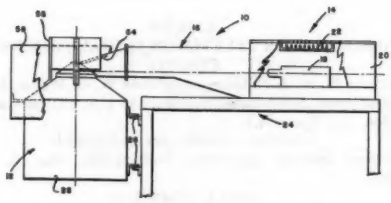


1. A device for delivering either broadcast TV signals or a CATV signal to a TV set having a vacant frequency not used for local TV broadcast signals, said device having means including an input terminal for simultaneously receiving a broadcast TV signal carrying a plurality of TV channel signals and a CATV signal carrying a plurality of CATV channel signals, means for selecting a specific CATV channel signal from said CATV signal, an output terminal adapted to be connected to the TV set, conversion means for receiving said CATV signal to convert the selected CATV channel signal into the frequency of the vacant channel of the TV set, switch means for switching electronically between bypassing signals received by said input terminal to said output terminal and delivery of signals received by said input terminal to said conversion means, said selecting means including selection push buttons for selecting desired CATV broadcasting channels and a bypass button for bypassing the signals received by said input terminal to said output terminal, wherein, for receiving a channel in the CATV signal said selection buttons are selectively operated to make said electronic switching means deliver the signal from said conversion means to said output terminal, whereas, for receiving TV broadcast signals, said bypass push button is operated to make said electronic switch means deliver said signal from said input terminal to said output terminal, said switch means including a first blocking diode connected between said input terminal and said output terminal, a second blocking diode connected between said input terminal and said conversion means, and biasing means for forwardly biasing said first blocking diode while reversely biasing said second blocking diode when broadcast TV signals are selected and reversely biasing said first blocking diode while forwardly biasing said second blocking diode when said CATV signal is selected, further including means including a third blocking diode connected between said conversion means and said output terminal, said biasing means forwardly biasing said third blocking diode when said CATV signal is selected and reversely biasing said third blocking diode when said broadcast TV signals are selected.

4,514,758
FALL VELOCITY INDICATOR/VIEWER

Robert O. Berthel, Windham, N.H.; Vernon G. Plank, Mansfield, Mass.; Stephen H. Jones, Weston, Mass., and Anthony J. Matthews, Salisbury, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1982, Ser. No. 442,496
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—93 **17 Claims**



1. A fall velocity indicator/viewer comprising:

a sampling compartment, said sampling compartment having an adjustably-sized port in the top portion thereof for allowing free falling particulate matter to pass therethrough and through a viewing area of preselected dimensions;

means located within said sampling compartment for providing a source of light at predetermined intervals of time, said light providing means being positioned so as to illuminate said free falling particulate matter as it is falling through said viewing area;

means located within said sampling compartment for reflecting said light in order to aid in the illumination of said free falling particulate matter in said viewing area during said predeteremined intervals of time;

means positioned a preselected amount of space from said

viewing area and in optical alignment with said viewing area for directly, continually monitoring said free falling particulate matter and providing signals representative thereof;

means for encasing said preselected space from said viewing area to said monitoring means, said encasing means having reflecting means therein for providing a top view of said particulate matter as said particulate matter passes through said viewing area thereby permitting said monitoring means to indirectly, continually monitor the top view of said particulate matter; and

means operably connected to said monitoring means for receiving said signals therefrom and providing pictorial information sufficient to clearly view said particulate matter at different magnifications as well as enable said fall velocity of said particulate matter to be determined.

4,514,759

DIAGNOSTIC RADIOLOGY SYSTEM FOR ANGIOGRAPHIC X-RAY EXAMINATIONS

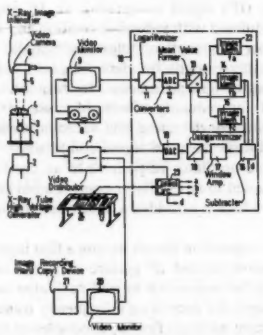
Heribert Amtmann, Langensendelbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,279

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202449

Int. Cl.³ H04N *5/32*; A61B *6/00*

U.S. Cl. 358—111 **2 Claims**



1. A diagnostic radiology system for angiographic x-ray examinations, comprising an image intensifier television chain, first and second image memories, control means controlling said memories for effecting storage of image data arriving at different times, subtractor means connected with said image memories for effecting the subtraction of the memory contents, and a reproduction device for registering the subtraction images, a third image memory being present, said control means controlling said first and third image memories to selectively effect storage of a masking image in said first and in said third of said image memories, and controlling said second image memory to effect storage of an image in said second image memory for processing in said subtractor means selectively in conjunction the masking image stored by said third image memory, and selectively in conjunction with the masking image stored by said first image memory.

4,514,760

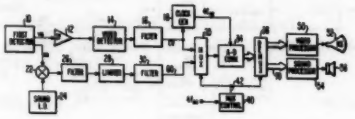
DIGITAL TELEVISION RECEIVER WITH TIME-MULTIPLEXED ANALOG-TO-DIGITAL CONVERTER

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 17, 1983, Ser. No. 467,284

Int. Cl.³ H04N *7/04, 5/60*

U.S. Cl. 358—143 **22 Claims**



11. In a television receiver including a source of analog video signals having a periodic line repetition rate and a period corresponding thereto, a source of analog sound signals, a digital video signal processor and a digital sound signal processor, apparatus comprising:

multiplexing means having inputs for receiving said analog video signals and said analog sound signals, respectively, said multiplexing means being responsive to a control signal for providing at an output thereof a selected one of said analog video signals and said analog sound signals;

an analog-to-digital converter having an input for receiving said selected one of said analog video signals and said analog sound signals, and having an output at which digital samples corresponding thereto are developed;

demultiplexing means having outputs coupled to said digital video signal processor and to said digital sound signal processor, respectively, said demultiplexing means being responsive to said control signal for coupling the digital samples supplied to an input thereof from the output of said analog-to-digital converter to a selected one of its outputs; and

control means for developing said control signal at a periodic rate no less than said line repetition rate of said analog video signals to apply the digital samples corresponding to said analog video signals to said digital video signal processor substantially as they are developed during said line repetition period and to apply digital samples corresponding to said analog sound signals to said digital sound signal processor during said line repetition period.

4,514,761

DATA ENCRYPTION TECHNIQUE FOR SUBSCRIPTION TELEVISION SYSTEM

Richard G. Merrell, Hebron, and Fredreck H. Auld, Glenview, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 23, 1982, Ser. No. 410,801

Int. Cl.³ H04N *7/16*; H04K *1/04*

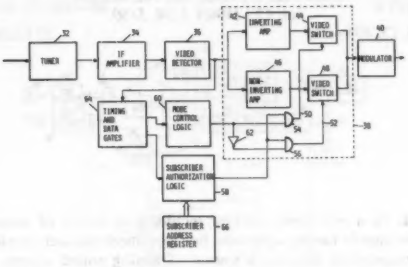
U.S. Cl. 358—122 **8 Claims**

1. A subscription television system comprising:

head-end means including means for transmitting selected fields of a television signal in a scrambled form, means for inserting a plurality of system control data bits in each of a plurality of horizontal lines of the vertical blanking intervals of said transmitted television signal, said system control data bits being variable from horizontal line to horizontal line and from field to field of said transmitted television signal, and means for inserting a plurality of mode control data bits forming a mode control code in a selected horizontal line of the vertical blanking intervals of said transmitted television signal, said mode control data bits being adapted for processing with selected ones of said system data bits according to a selected function for yielding a non-transmitted predetermined control code when the immediately following field of said television

signal is transmitted in said scrambled form and for yielding another code when the immediately following field of said television signal is not transmitted in said scrambled form; and

decoding means including means for receiving said transmitted television signal, logic means for processing the received mode control data bits and the received selected system data bits in accordance with said selected function for deriving said predetermined control code and said other code and means responsive to said derived predetermined control code for enabling unscrambling of the following field of said received television signal.



4,514,762

VIDEO SIGNAL MULTIPLYING CIRCUIT

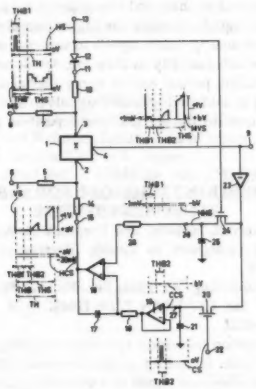
Henricus J. van Gompel, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,932

Claims priority, application Netherlands, Mar. 31, 1982, 8201341

Int. Cl.³ H04N *5/14, 5/34*

U.S. Cl. 358—163 **4 Claims**



1. A video signal multiplying circuit having a first terminal for receiving a video signal, a second terminal for receiving a multiplying signal and a third terminal for supplying a video signal multiplied by a signal multiplier, which terminals are coupled to respective corresponding terminals of the signal multiplier, the signals occurring with alternate scanning periods and blanking periods, characterized in that a fourth terminal of the signal multiplying circuit which, at the signal multiplier is associated with its second terminal, is coupled to a fifth terminal for receiving a periodically pulse-shaped signal having a pulse in a portion of the blanking period, the third terminal for supplying the multiplied video signal providing feedback via a signal sample-and-hold circuit having two outputs and a subsequent signal comparison-and-integrating circuit, to a sixth terminal which, at the signal multiplier, is associated with its first terminal, the signal sample-and-hold circuit being operative in the blanking period, more specifically in relation to the two respective outputs during the duration of said pulse and outside this pulse duration.

4,514,763

SOUND SIGNAL AND IMPULSE NOISE DETECTOR FOR TELEVISION RECEIVERS

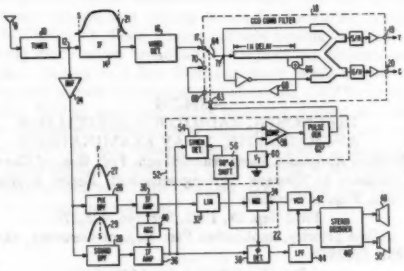
Abraham E. Rindal, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,826

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **11 Claims**



1. In a television system including a source of an intermediate frequency (IF) signal comprising an IF picture carrier amplitude modulated with video information and an associated IF sound carrier frequency modulated with audio information, having processing circuits for detecting said video information, and having compensation circuitry responsive to a defect control signal for reducing effects of noise in said picture carrier, apparatus for detecting said audio information and for providing said defect control signal comprising:

a controllable oscillator responsive to an oscillator control signal coupled to an oscillator control input and having an output at which is provided a controlled frequency output signal;

a frequency translation circuit having a first input coupled to be responsive to said IF picture carrier, a second input coupled to be responsive to said oscillator output signal, and an output for providing a frequency translated signal;

a phase detector having a first input coupled to be responsive to said IF sound carrier, a second input coupled to be responsive to said frequency translated signal, and an output;

lowpass filter means coupled between the output of said phase detector and the control input of said controllable oscillator for providing said oscillator control signal and for providing said audio information;

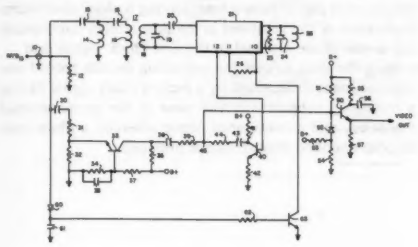
a synchronous detector having a first input coupled to be responsive to said sound carrier, a second input coupled to be responsive to said frequency translated signal, and an output for providing detected amplitude variations of said sound carrier indicative of the presence of noise in the picture carrier; and

control circuitry coupled to the output of said synchronous detector for providing said defect control signal whenever said detected amplitude variations exceed a predetermined threshold.

4,514,764
VIDEO MONITOR WITH AUTOMATIC SWITCHING BETWEEN RF AND BASEBAND VIDEO SIGNALS

Arthur N. Borg, Lake Forest, and William J. Mark, Glenview, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 7, 1983, Ser. No. 472,552
Int. Cl.³ H04N 5/46
U.S. Cl. 358—181 6 Claims



1. A video monitor selectively operable with RF input signals and baseband video signals comprising:

a common input terminal;

a first channel including RF amplification means, detection means and video amplification means coupled to said common input terminal;

a second channel including baseband video amplification means coupled to said common input terminal;

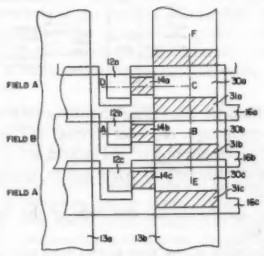
common video signal translation means coupled to the outputs of both said channels to provide selected video output signals; and

means for disabling said first channel responsive to the input of a baseband video signal at said common input terminal.

4,514,765
SOLID-STATE IMAGE SENSOR

Yutaka Miyata, Hirakata; Takao Chikamura, Kyoto, and Shinji Fujiwara, Minoo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 16, 1982, Ser. No. 408,677
Claims priority, application Japan, Aug. 20, 1981, 56-129373
Int. Cl.³ H04N 3/14
U.S. Cl. 358—213 10 Claims

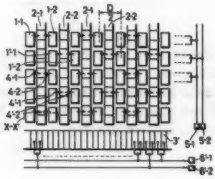


1. A solid-state image sensor comprising a semiconductor substrate having a plurality of groups of picture-element diodes and a signal scanning means for interlaced scanning of said groups of diodes; a photoconductive film formed on said semiconductor substrate and electrically connected to said diodes; a transparent electrode formed on said photoconductive film; and voltage means for differentially applying a voltage to said photoconductive film corresponding to each group of said diodes in order to compensate for possible differences of setting voltages or areas of the photoconductive film for the respective groups of diodes.

4,514,766
SOLID-STATE IMAGING DEVICE

Norio Koike, Tokyo; Iwao Takemoto, Hinode; Shinya Ohba, Shiroyama; Toshiaki Masuhara, Hinode, and Masaharu Kubo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,791
Claims priority, application Japan, Apr. 7, 1982, 57-56607; Aug. 16, 1982, 57-141115
Int. Cl.³ H04N 3/15
U.S. Cl. 358—213 4 Claims

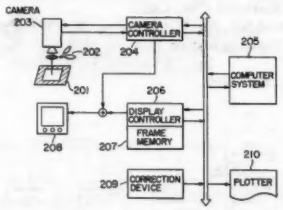


1. In a solid-state imaging device having a plurality of photoelectric elements which are disposed on a semiconductor substrate in rows and columns and which convert optical information into electric signals, and a plurality of vertical CCD shift registers and a horizontal CCD shift register which successively shift the electric signals in vertical and horizontal directions; a solid-state imaging device characterized in that said vertical CCD shift registers are allotted to said photoelectric elements of respective columns, and that the photoelectric elements of each column are alternatively connected to left and right vertical CCD shift registers, whereby said electric signals of said photoelectric elements of even-numbered rows and odd-numbered rows are separately delivered to said vertical CCD shift registers.

4,514,767
APPARATUS FOR MAKING MASKS AND/OR BLOCK COPIES FOR PRINTING

Yasuo Kubota; Kazuhiko Tanaka, and Kazuyuki Kikushima, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,870
Claims priority, application Japan, Dec. 26, 1981, 56-214319
Int. Cl.³ H04N 1/40, 5/65
U.S. Cl. 358—280 4 Claims



1. An apparatus for making masks for printing comprising:

(a) a picture input device for deriving through a filter a signal relating to the optical density of a picture of an object to be introduced as input;

(b) a picture processing device for subjecting the resulting picture optical density data from said picture input device

to operational processing thereby to form a line drawing picture including:

(i) a device for obtaining a picture signal relating to an outline specifying sheet, a block copy, or a pattern original from said picture input device to compute an optical density histogram,

(ii) a device for setting an optimum slice value relating to the state of optical density distribution of picture elements on the basis of the resulting output of the computing device; and,

(iii) a device for subjecting, on the basis of said optimum slice value, the output of said picture input device to thresholding; and

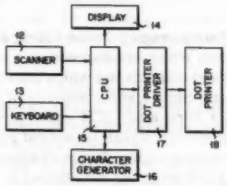
(c) a device for forming a mask or block copy for printing on the basis of the resulting line drawing picture data obtained by means of the picture processing device.

4,514,768

IMAGE FORMING APPARATUS

Toshimichi Ishizawa, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1983, Ser. No. 535,160
Claims priority, application Japan, Sep. 29, 1982, 57-170352
Int. Cl.³ H01N *1/00*
U.S. Cl. 358—296 **7 Claims**



1. An image forming apparatus comprising:

means for picking up document image information from a document through photoelectric conversion;

memory means in which pattern data corresponding to a plurality of different type face patterns are stored;

pattern data specifying means for specifying pattern data corresponding to at least one type face pattern stored in said memory means; and

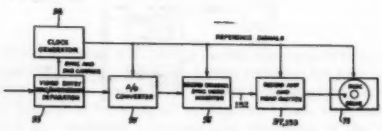
means for reproducing document image information and pattern data with different dot densities, respectively.

4,514,769

METHOD AND APPARATUS FOR PROCESSING COLOR VIDEO SIGNALS FOR RECORDING AND REPRODUCING

Luigi C. Gallo, Woodside, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Division of Ser. No. 763,762, Jan. 28, 1977, Pat. No. 4,181,817.
This application Dec. 31, 1979, Ser. No. 108,881
Int. Cl.³ H04N *5/781, 9/491*
U.S. Cl. 358—310 **4 Claims**



1. A method of processing an analog color video information signal for recording on a record medium, the color video information signal having horizontal line synchronizing pulses defining consecutive horizontal lines of color video information and a chrominance component including a subcarrier modulated by the color video information, the subcarrier having a frequency that is an odd multiple of one-half the frequency of the horizontal line synchronizing pulses, comprising the steps of:

sampling the analog color video information signal at times determined by a first clock signal having a predetermined frequency that is an odd multiple of the subcarrier frequency and a phase which is reversed on every consecutive horizontal line whereby a sampled signal is obtained;

converting the sampled signal to at least one digital data stream, said digital data stream having a phase discontinuity at each of the locations in the data stream corresponding to the phase reversal in the first clock signal; and

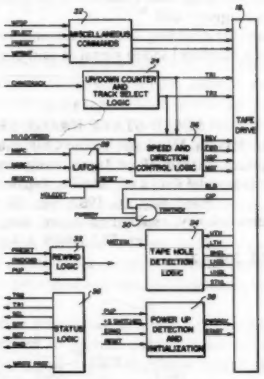
encoding the data stream for recording on the record medium at times determined by a second clock signal having a frequency substantially the same as the predetermined frequency and a continuous phase whereby a phase continuous encoded data stream is obtained.

4,514,770

ELECTRONIC CIRCUIT

Edgar A. Bowden, Arlington, and Robert V. Przybyl, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,174
Int. Cl.³ G11B *25/06*
U.S. Cl. 360—69 **6 Claims**



1. A method for providing recording information of a seismic multi-track tape recorder having first set of equipment receiving continuous power and second set of equipment having its power switched off when not in operation comprising the steps of:

detecting the rotational direction of the drive of the tape recorder;

sensing motion of the tape in the tape recorder;

determining which track is in position for use and producing an information signal in response thereto;

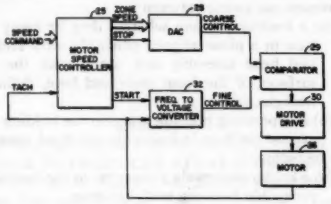
producing a first signal whenever motion is present and drive rotation is in one direction, a second signal whenever motion is present and drive rotation is in another direction, and a third signal whenever motion is absent; and

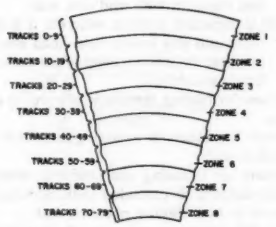
storing said first signal, said second signal and said third signal, and said information signal when said second set of equipment is not in operation.

4,514,771
METHOD AND APPARATUS FOR IMPROVING DISK STORAGE CAPACITY

Glenn Stark, Santa Cruz, and David M. Barton, San Jose, both of Calif., assignors to Victor Technologies Inc., Scotts Valley, Calif.

Filed Oct. 13, 1982, Ser. No. 434,075
Int. Cl.[3] G11B *19/24*
U.S. Cl. 360—73 7 Claims





1. A method of storing information on a rotatable magnetic disk using a movable recording transducer, said method comprising the steps of:

(a) rotating said disk at a first angular speed when said transducer is operating over a first group of adjacent tracks; and

(b) rotating said disk at a second angular speed when said transducer is operating over a second group of adjacent tracks located at different radial distances from the center of said disk from said first group of adjacent tracks;

said first and second angular speeds being selected to provide substantially the same relative linear speed between said transducer and the surface of said disk; and

the number and location of each said group of tracks being selected in accordance with the minimum circumferential length of a track required to accommodate a sector of information.

3. A motor speed controller for a rotatable magnetic disk system, said controller including:

means responsive to a command signal specifying a track zone on the disk recording surface for generating a disk speed reference signal corresponding to said track zone, said means including motor speed controller means for generating zone speed control signals in response to said track zone commands and digital to analog converter means for generating said disk speed reference signal in response to said zone speed control signal;

means for converting said disk speed reference signal to an output signal adapted to be coupled to a disk motor; and

means for generating a variable amplitude motor speed feedback signal from a variable frequency motor speed signal supplied from said disk motor,

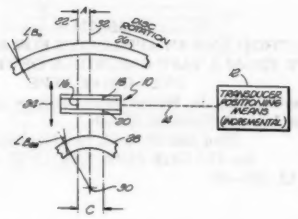
said converting means including first means for comparing said variable amplitude motor speed feedback signal with said disk speed reference signal and for switching said output signal in accordance with excursions in said motor speed feedback signal representing relatively small differences between motor speed and zone speed;

said disk speed reference signal generator further including means responsive to said variable frequency motor speed signal for altering the value of said zone speed control signal when the difference between motor speed and a presently specified zone speed is relatively large.

4,514,772
APPARATUS FOR READING/WRITING DATA ON MAGNETIC DISC

Gill Cantwell, 2434 Purdue Ave. #17, Los Angeles, Calif. 90064

Filed Feb. 9, 1983, Ser. No. 465,139
Int. Cl.[3] G11B *5/55*
U.S. Cl. 360—75 4 Claims



3. Apparatus for reading/writing data on a single flexible rotatable magnetic disc comprising:

(A) first means for magnetically reading/writing along a linear path parallel to a radial disposed in an orthogonal plane extending from the axis of rotation of said disc, said linear path being displaced from said radial by an amount substantially equal to 0.018 inches, said second means positioning said first means in incremental steps along said linear path at a ratio of:

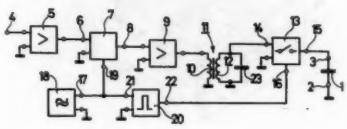
$$\frac{\text{HEAD GAP PITCH}}{\text{DATA RING PITCH}} = \frac{\sqrt{R_{outer}^2 - A^2} - \sqrt{R_{inner}^2 - A^2}}{R_{outer} - R_{inner}}$$

where R=the distance between the axis of rotation of the disc and the center of the data track under consideration, and A=0.018 inches.

4,514,773
CIRCUIT ARRANGEMENT FOR GENERATING AN ACTUATING SIGNAL FOR A PIEZO-ELECTRIC ELEMENT OF A POSITIONING DEVICE

Dietfried Süsz, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1983, Ser. No. 493,399
Claims priority, application Austria, May 13, 1982, 1887/82
Int. Cl.[3] G11B *21/02*
U.S. Cl. 360—77 16 Claims



1. A circuit arrangement for generating an actuating voltage for a piezo-electric element of a positioning device, said circuit arrangement comprising, means for applying a control signal which is representative of a positional error to a signal conver-

sion stage, means for supplying an output signal of the signal conversion stage to the primary circuit of a transformer, means coupling the piezo-electric element to a secondary circuit of said transformer via a bipolar switching device, means for actuating the bipolar switching device by a switching signal having a specific relation to the output signal of the signal conversion stage, characterized in that the signal conversion stage comprises an amplitude modulator to which the control signal is applied. an oscillator for applying a periodic carrier signal to said amplitude modulator, said carrier signal having a higher frequency than the control signal, and a pulse-shaper stage responsive to said carrier signal for developing a periodic pulse-shaped switching signal for actuating the switching device, said switching signal corresponding in time to only one of two peak amplitude values of the carrier signal and having a pulse width less than half the period of the carrier signal.

4,514,774

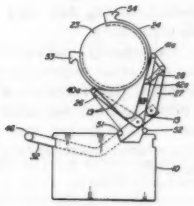
METHOD AND AN APPARATUS FOR EXTRACTING TAPE FROM A TAPE CARTRIDGE OF THE INTERNAL BELT-DRIVE TYPE

Dewey M. Sims, Jr., Wayne, Mich., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 30, 1982, Ser. No. 393,598

Int. Cl.³ G11B *15/66, 5/08, 15/32, 23/04*

U.S. Cl. 360—95 **6 Claims**



1. A method of withdrawing tape from an internal belt-drive tape carrier, said method comprising the steps of:

(a) applying a force to said tape in a direction so as to bias said tape towards the exterior of said carrier; and

(b) driving the reels of said carrier while performing step (a).

4,514,775

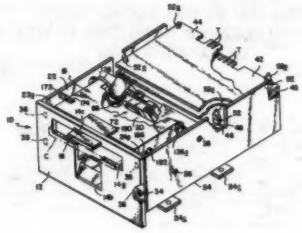
STREAMING CASSETTE TAPE TRANSPORT

George H. Manning, Nashua, and Pasquale R. Riccio, Salem, both of N.H., assignors to MFE Corporation, Salem, N.H.

Filed May 3, 1982, Ser. No. 374,046

Int. Cl.³ G11B *15/66, 21/08, 5/55*

U.S. Cl. 360—96.6 **6 Claims**



1. A cassette tape transport for a standard cassette comprising

A. a base;

B. a generally vertical front plate, said plate

(1) defining a cassette-receiving slot, and

(2) being attached to the base so that it makes an acute angle with the base;

C. a magnetic read/write head assembly fixedly mounted to the base at a location thereon spaced generally opposite the slot;

D. cassette holding means

(1) pivotally connected to the base so that the holding means can swing between

(a) a loading position wherein they lie away from the base in a plane aligned generally with said slot and said head assembly and, along with the opposing surfaces of the front plate and base, define a right triangle, and

(b) an operating position wherein the holding means lie against the base in line with said head assembly, and

(2) including

(a) a holder swingably connected to the base so as to be swingable between said positions;

(b) a cassette-receiving slider slidably mounted to the holder, said slider being movable by pushing a cassette through the slot when the holder is in its said loading position between

(i) an extended position wherein it resides adjacent to and registers with said slot, and

(ii) a retracted position wherein it is disposed away from said slot nearer said head assembly so as to position the leading edge of the cassette against the head assembly;

(c) means for biasing the slider toward its extended position;

(d) means for releasably retaining the slider in its retracted position; and

(e) means for releasing the retaining means so that the slider slides to its extended position when the holder is moved to said loading position; and

E. means for releasably retaining the holding means in its two positions, said transport defining a spatial volume that is about 3½ by 6 by 8 inches.

4,514,776

MAGNETIC HEAD AND METHOD OF MANUFACTURING THE SAME

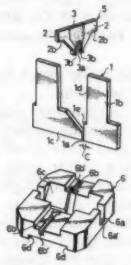
Shoichi Koyama, Horinouchi, and Tetsuya Iwata, Niigata, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,117

Claims priority, application Japan, May 8, 1981, 56-69060; Jun. 17, 1981, 56-93532

Int. Cl.³ G11B *5/12, 5/27, 5/251, 5/28*

U.S. Cl. 360—121 **10 Claims**



1. A magnetic head having a recording/reproducing core and an erase core, said erase core being formed as a unitary chip element comprised of two erase core elements joined together by a nonmagnetic binding material, and means including a groove formed in said nonmagnetic binding material prior to assembly of said magnetic head and adapted to receive

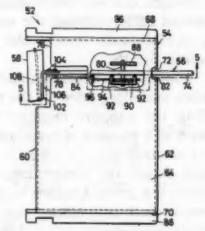
said recording/reproducing core for positioning it relative said erase core.

4,514,777

DEVICE FOR CLEANING THE MAGNETIC HEAD OF A RECORDER/REPRODUCER APPARATUS FOR USE WITH A MAGNETIC TAPE CARTRIDGE OR THE LIKE

Tomio Kudo, Tokorozawa, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,947
Claims priority, application Japan, May 9, 1983, 58-68770
Int. Cl.[3] G11B *5/41*
U.S. Cl. 360—128 17 Claims



1. A head cleaner device for a recorder/reproducer apparatus of the type for use with a magnetic tape cartridge, the apparatus having a housing defining a cartridge compartment for receiving the tape cartridge, and a magnetic head within the housing for data transducing contact with the magnetic tape of the tape cartridge, the head cleaner device comprising:

(a) a casing adapted to be slid into and out of the cartridge compartment of the recorder/reproducer apparatus;

(b) a handlebar operatively mounted to the casing and having one end projecting therefrom, the projecting end of the handlebar being capable of manipulation for moving another end thereof relative to the casing when the latter is received in the cartridge compartment; and

(c) a cleaner body mounted to the other end of the handlebar for direct contact with the magnetic head when the casing is received in the cartridge compartment;

(d) whereby the magnetic head can be cleaned by the cleaner body as the handlebar is manipulated while the casing is inserted in the cartridge compartment;

(e) said casing being approximately equal in size and shape to the tape cartridge and having a front side, a rear side opposite the front side, and a pair of opposed main sides joining the front and rear sides in right angular relation thereto, the rear side of the casing having formed therein an aperture for allowing said one end of the handlebar to project out of the casing, the front side of the casing having formed therein another aperture for exposing said other end of the handlebar to which the cleaner body is mounted; and

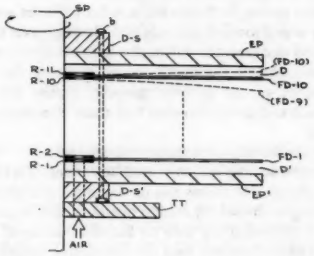
(f) said handlebar being mounted within the casing for pivotal motion about an axis parallel to all of the front, rear and main sides of the casing.

4,514,778

PARTITIONABLE PACK WITH END PLATES

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 124,750, Feb. 26, 1980, abandoned, which is a division of Ser. No. 960,267, Nov. 6, 1978, abandoned, which is a continuation of Ser. No. 864,011, Dec. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 711,647, Aug. 4, 1976, Pat. No. 4,086,640. This application Oct. 6, 1982, Ser. No. 433,180
Int. Cl.[3] G11B *23/02, 5/012*
U.S. Cl. 360—133 15 Claims



1. In combination with a pack of flexible record disks, the pack being formed and arrayed in concentric stack to be co-rotated at a prescribed rotational velocity,

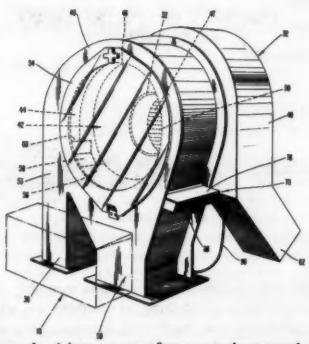
a pair of "floppy-stack" end-plates, each such stack including a number of contiguous unseparated flexible disks, and being disposed at a respective end of the pack and adapted to assume the form of an integral relatively rigid, flat plate when co-rotated with the pack at the said velocity.

4,514,779

METHODS AND APPARATUS FOR NEUTRALIZING A STATIC ELECTRICAL CHARGE ON POWDER PARTICLES

John S. Wilkinson, Venice, Fla., assignor to Therm-O-Type Corporation, Nokomis, Fla.

Filed Jun. 9, 1983, Ser. No. 502,549
Int. Cl.[3] H05F *3/00*
U.S. Cl. 361—213 17 Claims



1. In a powder/air separator for separating powder particles from an air stream in which the powder particles are entrained, said separator comprising:

a casing forming a separation chamber having a powder/air inlet and a powder outlet, said casing including a back wall and a side wall extending outwardly from said back

wall, said side wall including a curved portion which extends from said powder/air inlet and merges with a straight portion of said side wall, the latter extending toward said powder outlet,

an air outlet formed in said back wall,

suction means for creating suction pressure through said air outlet to evacuate said separation chamber,

a curved deflector wall disposed opposite said curved portion of said side wall to form therewith a generally annular space around said air outlet in which the air swirls before passing through said air outlet,

said powder/air inlet being arranged to introduce a powder-/air stream tangentially into said separation chamber under the influence of the suction created therein by said suction means, such that the powder particles are centrifugally urged toward said side wall during travel therealong toward said powder outlet, the improvement comprising:

a static charge eliminator for neutralizing the electrical charge of the powder particles before the particles reach said powder outlet, said static eliminator comprising:

an electrically chargeable means, and

air conducting means extending around said electrically chargeable means and having a gas exit communicating with said separation chamber, and a gas entrance communicating with air located outside of said separation chamber, said air conducting means arranged to conduct flow of air across said electrically chargeable means from said gas inlet under the influence of suction from said separation chamber, with ozone gas being formed as a reaction product during passage of such air across said electrically chargeable means,

said gas exit being arranged to introduce the ozone gas into said separation chamber along a portion of said side wall such that the ozone gas contacts and neutralizes the powder particles traveling therepast,

said delector wall and said side wall forming a gap through which the powder travels toward said powder outlet, said gas exit being arranged to introduce ozone gas into said separation chamber downstream of said gap.

4,514,780

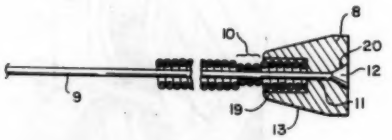
DISCHARGE ELECTRODE ASSEMBLY FOR ELECTROSTATIC PRECIPITATORS

Richard C. Brussee, Euclid, and Robert E. Dowd, Jr., Kirtland, both of Ohio, assignors to Wm. Neundorfer & Co., Inc., Cleveland, Ohio

Filed Jan. 7, 1983, Ser. No. 456,482

Int. Cl.³ B03C *3/41*

U.S. Cl. 361—226 **15 Claims**



1. A high-voltage discharge electrode assembly for an electrostatic precipitator comprising, in combination, an elongated discharge electrode, an anchoring element, one end of said elongated discharge electrode being secured at said anchoring element, and a flexible shroud as an attachment over said elongated high-voltage discharge electrode which closely surrounds said elongated discharge electrode adjacent said anchoring element, whereby the life of said electrode in said electrostatic precipitator is extended.

4,514,781

CORONA DEVICE

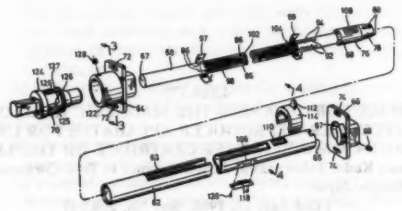
Paul E. Plasschaert, R.R. #1, Limehouse, Ontario L0P 1H0; Dolf Landheer, 49 Melrose Ave., Toronto, Ontario, Canada M5M 1Y6, and Harold W. Cobb, 30 Conant St., Acton, Mass. 01720

Filed Jun. 10, 1983, Ser. No. 503,007

Claims priority, application Canada, Feb. 1, 1983, 420655

Int. Cl.³ H01T *19/00*

U.S. Cl. 361—230 **8 Claims**



1. A corona device for use with a dielectric surface to modify electrostatic charge on the surface, the device comprising:

an elongate dielectric support member;

a plurality of straight corona electrodes mounted on the member in spaced relation about the member, each electrode having an electrically conductive core and an electrically insulating sheath;

an electrically conductive biasing member encasing the support member and electrodes on the support member;

means journalling the support member for rotation and angular location at a number of positions equal to at least the number of electrodes;

electrical contact means for connecting the device to an electrical source, the contact means being coupled to the journalling means and establishing continuous electrical connection to the biasing member and to a selected one of the electrodes whereby upon rotating the support member into each of said selected positions electrical connection is made to a different one of the electrodes so that the user can select the electrodes to isolate damaged electrodes until all of the electrodes have been used.

4,514,782

MULTIPLE FEEDTHROUGH-CAPACITOR UNIT

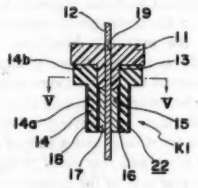
Yukio Sakamoto, and Takeshi Tanabe, both of Takefu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 557,853

Claims priority, application Japan, Mar. 1, 1983, 58-29946[U]

Int. Cl.³ H01G *1//14;* H01R *9/00*

U.S. Cl. 361—306 **10 Claims**



1. A feedthrough-capacitor unit having a plurality of feedthrough-capacitors, said unit comprising:

a plate made of synthetic resin;

a plurality of projections extending from one face of said plate, a respective first through-hole extending concentrically through each said projection and also extending through a corresponding portion of said plate;

a plurality of terminals, a respective one of said terminals being mounted in each of said first through-holes and extending through its respective through-hole; and

a plurality of capacitor bodies each having a second through-hole extending therethrough, each of said capacitor bodies being mounted on a respective one of said projections with an inner surface of its second through-hole mating with an outer surface of its respective projection.

4,514,783

ENCAPSULATED, COMPRESSED-GAS-INSULATED, HIGH-VOLTAGE SWITCHING INSTALLATION

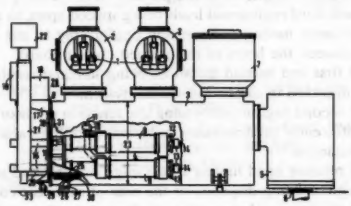
Willi Olsen; Heinz Padderatz; Joachim Palm, and Christian Pircher, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,009

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 8204536[U]

Int. Cl.³ H02B *11/14*

U.S. Cl. 361—336 **5 Claims**



1. In an encapsulated, compressed-gas-insulated, high-voltage switching installation comprising a main pressure vessel of electrically conductive material, a circuit breaker which includes interrupter units with an arc extinguishing device and a hydraulic drive for operating the interrupter units, a vertically extending base plate closing off one end of the pressure vessel, said interrupter units being horizontally disposed in the pressure vessel and fastened to the base plate on the side facing the interior of the pressure vessel and being detachably connected to adjoining conductors and parts of said drive being fastened on the outside of the base plate, the improvement comprising the base plate supporting all parts of the interrupter units, the arc extinguishing device and the drive, including a control unit and a hydraulic accumulator, as a structural movable unit, the base plate including at least three rollers detachably connected thereto for rolling on the ground or a foundation, at least one of said rollers being disposed on one side of said base plate and at least one other of said rollers being disposed on an opposite side of said base plate, thereby defining a wheel base extending from said one side of said base plate horizontally to said opposite side of said base plate, said interrupter units extending horizontally substantially beyond said wheel base on said one side of said base plate, said control unit and said accumulator extending on said opposite side of said base plate beyond said wheel base, said wheel base having an area and said interrupters, said arc extinguishing device and said drive, including said control unit and said accumulator, being so disposed that a vertical line going through the center of gravity of the structural unit is located within the area bounded by the rollers.

4,514,784

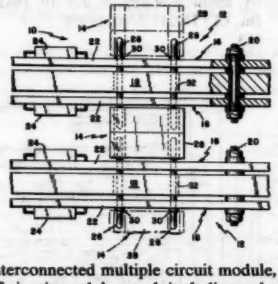
INTERCONNECTED MULTIPLE CIRCUIT MODULE

John T. Williams, and Melvin C. August, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Filed Apr. 22, 1983, Ser. No. 487,515

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **5 Claims**



1. An interconnected multiple circuit module, comprising:

a pair of circuit modules, each including at least one circuit board therein;

an array of male pins mounted on each circuit module, each array including a plurality of pins located in a predetermined arrangement and extending substantially perpendicular to the associated circuit board such that opposite corresponding ends of the pins are positioned on opposite sides of the associated circuit module:

a free connector block of dielectric material with opposite ends, each end including an array of openings therein receiving the pins on the associated circuit module; and

dual-entry female contact means within said block releasably engaging pins inserted into the openings to effect electrical connection between said circuit modules, said contact means having a structure which provides differential mechanical connecting resistance with the pins of one module versus the pins of the other module to facilitate predictable controlled connection and disconnection of said circuit modules.

4,514,785

METHOD OF MANUFACTURING AN IDENTIFICATION CARD AND AN IDENTIFICATION MANUFACTURED, BY THIS METHOD

Paul Parmentier, Cailly-sur-Eure, France, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 416,791, Sep. 10, 1982, Pat. No. 4,483,067. This application Apr. 23, 1984, Ser. No. 602,883

Claims priority, application France, Sep. 11, 1981, 81 17231

Int. Cl.³ H05K *1/18*

U.S. Cl. 361—401 **1 Claim**

1. An identication card having an integrated semiconductor circuit which is electrically connected on both sides to conductor patterns on at least one side of a secondary carrier, which secondary carrier is mounted in a primary carrier together with the integrated circuit as one unit, the integrated circuit being enclosed by an electrically insulating material which fills a recess in one of said carriers, characterized in that:

the secondary carrier (11) which is provided with a conductor pattern (3, 5) on both sides comprises at least one plated-through hole (7, 17) in which a recess (15) in the secondary carrier (11) opens, the integrated circuit (13) being arranged in the recess (15) and being electrically connected on one side to the conductor pattern (3) on one side of the secondary carrier (11) and on the other side, by means of an electrically conductive bonding medium (21) and the metal hole plating (18), to the conductor pattern (5) on the other side of the secondary carrier (11).

4,514,786

INTEGRATED-CIRCUIT SUPPORT DEVICE EMPLOYED IN A SYSTEM FOR SELECTING HIGH-RELIABILITY INTEGRATED CIRCUITS

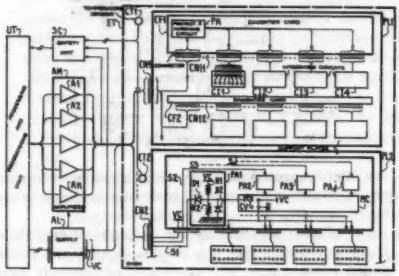
Stephane Charruau, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 396,451, Jul. 8, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 618,780

Claims priority, application France, Jul. 10, 1981, 81 13681

Int. Cl.³ H02H *3/20;* H05K *1/14*

U.S. Cl. 361—413 10 Claims



1. An integrated-circuit support device employed in a system for selecting high-reliability circuits as a function of predetermined thermal and dynamic stresses, the support device comprising: a plurality of plates for receiving integrated circuits each of said integrated circuits having a plurality of terminal pins with each of said pins having a reference number, wherein said integrated circuit pins are arranged in two rows, and said plurality of plates establishing interface connections to connect in parallel those of said terminal pins of said integrated circuits having the same reference number, each plate being comprised of a parent card and a plurality P of daughter cards, the said interface connections being formed as a multilayer printed circuit on the daughter cards and is in the form of a double-face circuit on the parent card which is provided on one face with a first series of P socket connectors for receiving the said daughter cards and with a second series of NXP socket connectors for receiving said integrated circuits, each daughter card being associated with a plurality N of integrated circuits, the said plates having a similar structure to form only a first, a second and a third version of different plate designs by utilizing only three types of integrated-circuit socket connectors for receiving the different integrated-circuit packages of usual types which correspond respectively to spacing standards of 0.3 inch, 0.4 inch and 0.6 inch between the two rows of terminal pins, said first, second and third versions of plates being each equipped with one type of integrated-circuit socket connector corresponding to one of the spacing standards aforesaid, and the said printed circuits enabling separate and active connection of all the terminal pins of the integrated circuits through the corresponding daughter cards from a single coupling connector located externally of the plate.

4,514,787

ELECTRONIC COMPONENT SERIES

Fumihiko Kaneko, Nagaokakyo; Tetsuya Murakawa; Koichi Nitta, both of Fukui; Noriaki Yamana, Takefu; Masashi Takeda, and Kunio Tachi, both of Fukui, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 5, 1983, Ser. No. 491,885

Claims priority, application Japan, May 13, 1982, 57-82098

Int. Cl.³ H05K *7/02*

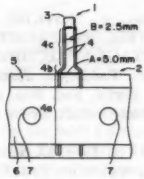
U.S. Cl. 361—420 6 Claims

1. An electronic component series wherein a plurality of parallel lead type electronic components each having a body with first and second lead wires extending forward therefrom and being equispaced along a retainer band and distributed along the length of the retainer band with the lead wires extending in the same direction and positioned by the retainer band, whereby the electronic components are retained, said electronic component series being characterized in that

said lead wires being divided into a first region, a second region rearward of said first region and a third region rearward of said second region, said regions having mutually different functions,

said first region performing the function of retaining the electronic component with respect to the retainer band by being positioned along and on the retainer band,

in said first region the lead wires of each electronic component being spaced apart by a first distance equal to a constant dimension serving as a standard,



said third region performing the function of attaching the electronic component to a printed circuit board by being inserted into holes in the printed circuit board,

in said third region said leads being spaced apart by a second distance having a dimension conforming to the distance between the holes of the printed circuit board,

said first and second distances being unequal resulting in a difference in dimension therebetween,

said second region performing the function of absorbing the difference in dimension between said first and second distances,

said retainer band having a rear edge, said second and third regions being disposed to the rear of said rear edge,

said third region being substantially greater than said second region when measured in a direction perpendicular to said rear edge.

4,514,788

COMPOSITE COVER PLATE AND APPLICATION OF THE SAME

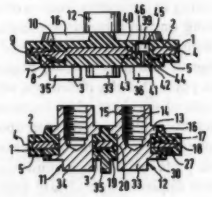
Rudolf Klaschka, Tannenweg 9, D-7896 Wutoeschingen 3, and Franz J. Wolf, Sprudelallee 19, D-6483 Bad Soden-Salmuenster, Fed. Rep. of Germany

Continuation of Ser. No. 269,295, Jun. 1, 1981, abandoned. This application Mar. 20, 1984, Ser. No. 591,242

Claims priority, application European Pat. Off., May 15, 1981, 31103759.7

Int. Cl.³ H01G *9/00;* H01M *2/08*

U.S. Cl. 361—433 11 Claims



1. Composite cover plate for an electric component comprising an aluminum disc, said aluminum disc having an outer

edge, said aluminum disc having a first side and a second side, a rubber covering on said first side of said aluminum disc, said rubber covering having a peripheral portion extending around said outer edge and partially onto said second side of said aluminum disc, an artificial material disc on said second side of said aluminum disc, said artificial material disc being resistant to gas and fluid permeation, at least one lead-through element extending through the composite cover plate, said lead-through element having a first flange means disposed against said rubber covering and a second flange means disposed against said artificial material disc, said artificial material disc, said aluminum disc and said rubber covering each having an opening through which said lead-through element passes such that said lead-through element with said first and second flange means function as a rivet holding said rubber covering, said aluminum disc, and said artificial material disc together, said aluminum disc being provided on said first side with one or more first protrusion-recess means which fit snugly into complementary first recess-protrusion means in the adjoining surface of said rubber covering, said aluminum disc also being provided on said second side with one or more second recess-protrusion means which fit lockingly into engagement with complementary second protrusion-recess means in the adjoining surface of said rubber covering, whereby said first and second protrusion-recess means and said first and second recess-protrusion means prevent torsional displacement between said aluminum disc, said artificial material disc and said artificial material disc, said second flange means comprising one or more first flange segments, and one or more complementary first recess segments in said artificial material disc element for receiving said one or more first flange segments, whereby said one or more first flange segments and said one or more recess segments prevent torsional displacement of said lead-through element.

4,514,789

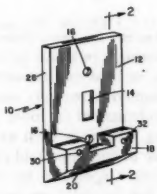
ILLUMINATED LIGHT SWITCH PLATE WITH LED AND OSCILLATOR CIRCUIT

Michael H. Jester, 11626 Vaca Pl., San Diego, Calif. 92124

Filed Mar. 7, 1984, Ser. No. 587,049

Int. Cl.³ F21V *33/00*

U.S. Cl. 362—95 **10 Claims**



1. An apparatus for aiding a person in locating a conventional wall mounted light switch in the dark, comprising:

a generally planar switch plate configured to be removably secured over the light switch and having an aperture in the medial portion thereof for receiving therethrough an actuator of the light switch;

a housing connected to the switch plate for positioning on the exterior side of the wall when the switch plate is secured over the light switch;

means mounted within the housing for removably holding a battery and for establishing electrical connection with a positive terminal and a negative terminal of the battery when inserted;

an LED mounted in the housing so as to be visible externally of the housing;

a solid state oscillator mounted within the housing;

a capacitor mounted within the housing; and

means for electrically interconnecting the LED, the battery holding means, the solid state oscillator and the capacitor independent of the light switch so that when the battery is inserted into the battery holding means the LED will flash to provide an eye catching signal for at least three months before the battery is substantially drained of its stored energy.

4,514,790

RECHARGEABLE POWER PACK AND A POCKET LAMP FOR USE THEREWITH

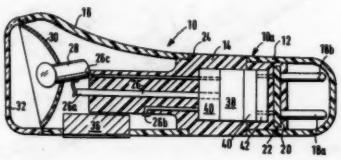
Elmar Will, Makartstr. 9, D-8000 München 71, Fed. Rep. of Germany

Continuation of Ser. No. 255,271, Apr. 17, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 566,969

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015248

Int. Cl.³ F21L *7/00*

U.S. Cl. 362—183 **7 Claims**



1. A hand-held electrical device comprising a first detachable portion containing a rechargeable power pack and a pair of contact pin means electrically connected to said power pack and for connection to an AC current source to recharge through circuit means said power pack when said first detachable portion is separated from said electrical device, said first detachable portion having a third contact means connected to said power pack for bypassing said circuit means, a second detachable portion having a first section having separate first and second contact means, said first contact means for contacting one of said pin means and said second contact means for contacting said third contact means of said first detachable portion, said second detachable portion having third and fourth contact means each disposed relative to each other to provide, when said first and second portions are attached, a circuit for connection through said third and fourth contact means to a DC current source to recharge said power pack of said first detachable portion,

a housing including spaced first and second contact means which control the operation of said electrical device and which are positioned to engage respectively with said second detachable portion when said second detachable portion is attached to said housing whereby a circuit will be established from said power pack to said electrical device through said second detachable portion.

4,514,791

LAMP RIBBON

Naomitsu Tokieda, 26-12, Shimomeguro 5-chome, Meguro-ku, Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,023

Int. Cl.³ F21V *21/00*

U.S. Cl. 362—249 **5 Claims**

1. A lamp ribbon, comprising:

(a) a thin flexible belt construction, comprising:

(a1) an upper belt layer and a lower belt layer, each generally formed as a strip and made of a flexible electrically insulating material, said upper and lower belt layers being laid against one another, aligned together, and fixed to one another continuously along their respective lengths; and

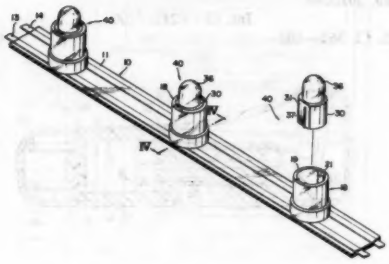
(a2) two conductors, each formed as a strip and made of an electrically conducting material, which are laid between said upper belt layer and said lower belt layer

parallel to one another and separated by a certain distance, and which are held by being sandwiched between said upper belt layer and said lower belt layer;

(a3) parts of said lower belt layer at a plurality of places thereon being absent, so as to expose said two conductors for a certain longitudinal distance at each of said plurality of places, at each such place a pair of apertures being formed through said upper belt layer between said two conductors so as to open to said place; and

(b) a plurality of lamp units, each comprising:

(b1) a bulb socket which is rigidly attached to said belt construction opposed to a one of said plurality of places where said lower belt layer is absent;



(b2) a pair of terminals which protrude from said bulb socket, each of said terminals passing through one of the pair of apertures formed in said upper belt layer opening to said one of said plurality of places and then being bent over and being soldered to one of said conductors; and

(b3) a bulb comprising a pair of terminals and a bulb base into which said bulb is detachably fitted with said terminals of said bulb being bent so as to hold said bulb to said bulb base, said bulb base being slidably fittable into said bulb socket so that each one of said pair of terminals of said bulb is thus electrically connected to one of said terminals of said bulb socket.

4,514,792

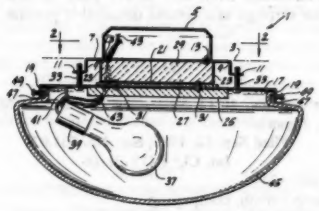
LIGHTING FIXTURE WITH TRIPLE INSULATING MEANS

Dale A. Klaus, Chesterfield, Mo., assignor to International Export Company, St. Louis, Mo.

Filed Jan. 9, 1984, Ser. No. 569,037

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—294 **5 Claims**



1. A lighting fixture adapted to be mounted on a ceiling by attachment to an outlet box in the ceiling, comprising:

a crossbar adapted to be attached to the bottom of the outlet box in a position extending horizontally across the bottom of the box and of such length as to extend at both ends beyond the box, said crossbar having downwardly extending legs and generally horizontally extending feet at the lower ends of the legs, said legs and feet forming an elongate heat path for the reduction of heat transferred to the box;

a plate below the crossbar with thermally insulated spacer means between the plate and the crossbar, said spacer means being positioned inside of said legs such that a gap results between said spacer means and each of said legs for exposing said heat path to the cooler air outside said lighting fixture;

means securing the plate to the crossbar with the spacer means between the plate and the crossbar comprising screws extending up though holes in the plate threaded in holes in the feet;

a light source on the bottom of the plate; and

a diffuser for the light source secured to the plate at the rim of the plate.

4,514,793

REFLECTOR SYSTEM FOR SECURING TO A LIGHT SOURCE

Knud Andreasen, Alfr. Christensens Vej 11, 2850 Naerum, Denmark

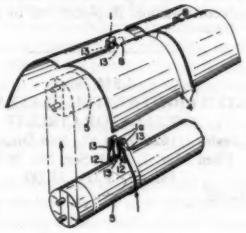
PCT No. PCT/DK82/00111, § 371 Date Aug. 2, 1983, § 102(e) Date Aug. 2, 1983, PCT Pub. No. WO83/02145, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 13, 1981, Ser. No. 531,833

Claims priority, application Denmark, Dec. 15, 1981, 3511/81

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—306 **4 Claims**



1. A reflector system for securement above an elongated light source comprising a reflector having at least one pair of adjacent apertures, at least one mounting clip having a first circular portion adapted to partially encircle that light source including full encirclement of the lower portion of said source, said portion having two ends each extending generally upwardly into said pair of apertures, said clip including means for securely engaging said apertures to maintain said reflector suspended above and spaced from said light source despite gravitational forces.

4,514,794

ATTACHMENT PROVISION FOR EXCHANGEABLE ACCESSORIES AT ILLUMINATION BODIES

Walter Haberthür-Heilig, Hofstettin, Switzerland, assignor to Bron Elektronik AG, Allschwil, Switzerland

Filed Jul. 30, 1983, Ser. No. 515,917

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227167

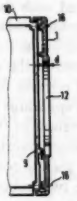
Int. Cl.³ F21S *1/02, 13/02*

U.S. Cl. 362—439 **20 Claims**

1. An attachment provision for exchangeable accessories for illumination bodies comprising an illumination body;

an adapter plate having a receiving opening and which is attached to the illumination body for supporting a accessory having an axis and the adapter plate having at least two recesses for receiving and supporting an adapter flange of an accessory and wherein the recesses are dis-

posed at a distance, but are not disposed such that they would meet the requirements of an n-fold rotation axis with n equal to or larger than 2 for coinciding with said axis; and an accessory having an adapter flange with at least two cam toes to grip through the recesses of the



adapter plate where the cam toes are disposed at a distance, but are not disposed such that they would meet the requirements of an n-fold rotation axis directed vertically to the flange plane with n equal to or larger than 2 for said axis and where the cam toes support the accessory.

4,514,795

HIGH-VOLTAGE GENERATOR, NOTABLY FOR AN X-RAY TUBE

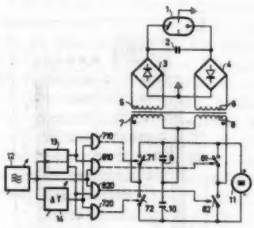
Alfred J. van der Zwart, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 16, 1983, Ser. No. 495,189

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218535

Int. Cl.³ H02M *3/315*

U.S. Cl. 363—27 **6 Claims**



1. A high voltage generator for use with an X-ray tube comprising:

a resonant direct current/alternating current converter for alternative flow of charge transfer currents from a capacitor device through two primary windings of a high-voltage transformer by means of switches,

wherein said capacitor device conducts said currents through each of said two primary windings of said transformer, and

a controllable delay means for delaying switching pulses to said switches,

so that currents through said primary windings start flowing at different time instants.

4,514,796

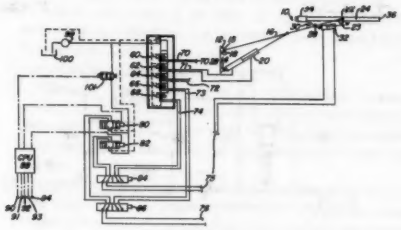
METHOD AND APPARATUS FOR CONTROLLING THE POSITION OF A HYDRAULIC BOOM

John D. Saulters, Cambridge, and Roger H. Scarr, Pickering, both of Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 8, 1982, Ser. No. 415,855

Int. Cl.³ E21C *11/00*; F16M *13/00*

U.S. Cl. 364—142 **6 Claims**



1. A method for controlling orientation of an articulated boom of the type having a first portion and a second portion, said first portion capable of moving in a horizontal and vertical direction and capable of rotating about a longitudinal axis thereof;

said second portion of said boom pivotally mounted on said first portion and capable of moving in a vertical and horizontal direction with respect to said first portion, said method comprising the steps of:

sensing and storing in a computer means the actual angles of said first portion with respect to a reference angle in the horizontal, vertical and rotational directions;

sensing and storing in a computer means the actual angle of said second portion with respect to a reference angle in both the horizontal and vertical directions;

inputting the predetermined horizontal and vertical angles of said predetermined position of said second portion into said computer;

calculating in said computer means the equivalent horizontal and vertical angles of said second portion with respect to said horizontal and vertical predetermined angles when said first portion is at said rotational reference angle and storing said calculated equivalent angles;

calculating in said computer means first vertical and horizontal angles each equal to the sum of the actual first portion vertical and horizontal angles and said second portion calculated equivalent horizontal and vertical angles;

moving said end of said second portion of said boom to a predetermined point;

calculating continuously, while said movement is occurring, second vertical and horizontal angles each equal to the sum of the newly sensed actual first and second portion vertical and horizontal angles;

calculating the reference difference between said first calculated vertical and horizontal angles and said second calculated vertical and horizontal angles;

sensing the actual rotational angle of said first portion;

calculating the actual horizontal and vertical difference angles utilizing said actual rotational angle and said calculated reference difference between said first calculated and said second calculated vertical and horizontal angles;

continuously moving said second portion in said vertical and horizontal direction to reduce said actual differences;

continuously comparing the calculated actual horizontal and vertical angular differences with the references differences between the first calculated and second calculated horizontal and vertical angles; and

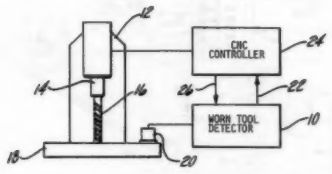
stopping movement when the comparison between said differences shows substantial equality.

4,514,797

WORN TOOL DETECTOR UTILIZING NORMALIZED VIBRATION SIGNALS

John D. Begin, Warren, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Sep. 3, 1982, Ser. No. 414,735
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—148 **17 Claims**



1. In a worn tool detector system for analyzing input signals from a sensor where the signal is in the form of an analog waveform exhibiting periodic impulses exceeding the average amplitude of the waveform as the tool wears, the improvement comprising:

a variable gain amplification network connected to the sensor, said network including at least one digitally controlled component for effecting a change in gain of the network;

reference means supplying a fixed reference voltage;

comparator means having inputs coupled to outputs of the variable gain network and said fixed reference voltage;

digital control means having an input coupled to an output of the comparator and an output coupled to the digitally controlled component, operative to normalize the sensor signal by varying the gain of said network until the average amplitude of the waveform is substantially equal to the reference voltage; and

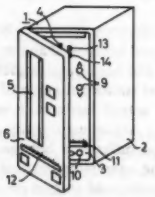
detector means coupled between the gain network and the digital control means for detecting the occurrence of the impulses by sensing voltage levels of the amplified sensor signal exceeding the normalized level.

4,514,798

ELECTRICAL CONTROL APPARATUS

Wolfgang Lesche, and Volker Rindfleisch, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,297
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125779; Apr. 26, 1982, 3216286
Int. Cl.³ G05B *11/01, 11/36*
U.S. Cl. 364—188 **5 Claims**



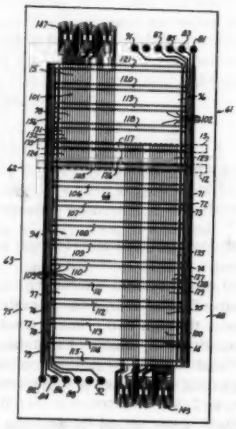
1. In a control apparatus including a control panel and a movable panel which can be moved to overlay or expose at least a portion of the control panel, two indicators disposed on the control panel, control means disposed on the control panel, switch means for conditioning the apparatus to operate in first and second modes and processor means for controlling operations of the apparatus, each indicator indicating a different parameter in the first and the second modes, and the control means being operative in each mode to affect the parameters corresponding to said mode and to affect the indication thereof by the respective indicators, the improvement comprising the switch means being associated with the control panel and the movable panel such that the switch means automatically conditions the apparatus to operate in the first mode while preventing operation of the apparatus in the second mode when the movable panel exposes said portion of the control panel and automatically conditions the apparatus to operate in the second mode while preventing operation of the apparatus in the first mode when the movable panel overlays said portion of the control panel, said control means comprising a first control associated with a first of the two indicators and a second control associated with a second of the two indicators, input-output means responsive to the switch means for coupling the first indicator, the first control and the processor means in the first and second modes so that the first indicator indicates a different parameter in each mode and the first control affects the parameters corresponding to the respective modes and the indication thereof on the first indicator, and for coupling the second indicator, the second control and the processor means in the first and second modes so that the second indicator indicates a different parameter in each mode and the second control affects the parameters corresponding to the respective modes and the indication thereof on the second indicator, a scale on the control panel and a scale on the movable panel associated with the first indicator and a scale on the control panel and a scale on the movable panel associated with the second indicator, the scales on the control panel being overlayed by the movable panel when the movable panel overlays said portion of the control panel.

4,514,799

BUS SYSTEM ARCHITECTURE AND MICROPROCESSOR SYSTEM

William H. Spencer, Monrovia, and Thomas E. Anderberg, Chatsworth, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 24, 1981, Ser. No. 237,804
Int. Cl.³ H05K *1/04*; G06F *3/00*
U.S. Cl. 364—200 **5 Claims**



1. In a method of providing on a substrate a bus line system for first and second circuit boards designed to extend across

said substrate, the improvement comprising in combination the steps of:

providing at a first region of one major plane of said substrate individually dedicated first, second and third bus lines arranged in a first bus line array for coupling to the first circuit boards;

extending a portion of said first bus line array including said first, second and third bus lines over a first part of said substrate;

providing at a distinct second region of the substrate individually dedicated fourth, fifth and sixth bus lines corresponding, respectively, to said first, second and third bus lines, and being arranged in a second bus line array for coupling to the second circuit boards;

extending a portion of said second bus line array including said fourth, fifth and sixth bus lines over a second part of said substrate adjacent said first part;

said portion of the second bus line array including said fourth, fifth and sixth bus lines in said second part of the substrate representing a mirror image of said portion of the first bus line array including said first, second and third bus lines in said first part of the substrate, as seen with respect to a plane between said first and second parts perpendicular to said one major plane;

providing a first microprocessor on one of said first circuit boards;

providing a second microprocessor on one of said second circuit boards;

providing first peripherals for reading data from or recording data on a document;

providing second peripherals for transporting said document among said first peripherals for reading data from or recording data on said document by said first peripherals;

connecting said first peripherals to further ones of said first circuit boards;

connecting said second peripherals to further ones of said second circuit boards;

controlling said second microprocessor and said first peripherals with said first microprocessor via said first bus line array; and

controlling said second peripherals with said second microprocessors via said second bus line array.

4,514,800

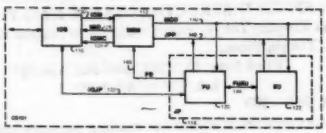
DIGITAL COMPUTER SYSTEM INCLUDING APPARATUS FOR RESOLVING NAMES REPRESENTING DATA ITEMS AND CAPABLE OF EXECUTING INSTRUCTIONS BELONGING TO GENERAL INSTRUCTION SETS

Ronald H. Gruner, Cary, N.C.; Gerald F. Clancy, Saratoga, Calif.; Craig J. Mundie, Cary, N.C.; Steven J. Wallach, Saratoga, Calif.; Stephen I. Schleimer, Chapel Hill; Walter A. Wallach, Jr., Raleigh, both of N.C.; John K. Ahlstrom, Mountain View, Calif.; David H. Bernstein, Ashland, Mass.; Michael S. Richmond, Pittsboro, N.C.; David A. Farber, Durham, N.C.; John F. Pilat, Raleigh, N.C.; Richard A. Belgard, Saratoga, Calif., and Richard G. Bratt, Wayland, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,525

Int. Cl.³ G06F *9/16, 13/00*

U.S. Cl. 364—200 **14 Claims**



1. A digital computer system comprising:

(1) memory means for performing memory operations including storing and providing data items in response to memory commands including addresses of said data items, said data items including

(A) instructions, each said instruction containing

(i) an operation code of a plurality of said operation codes, each said operation code specifying an operation of a plurality of operations performed by said digital computer system, and each said operation code belonging to one of a plurality of different operation code sets, the operation codes in a given operation code set being definable solely with reference to said given operation code set, and selected ones of said instructions further containing

(ii) a name representing an item of data to be used in the operation specified by the operation code in said selected instruction, and

(B) sequences of said instructions; and

(2) processor means connected to said memory means for performing the operations performed by said system and providing memory commands to said memory means in response to said instructions, said processor means including

(A) operation code decoding means for decoding the operation code in an instruction received in said processor as required by the operation code set to which the operation code in said received instruction belongs,

(B) name resolution means for receiving the name in said received instruction and for deriving the address for the item of data represented by said received name using a current architectural base address, and

(C) control means responsive to said operation code decoding means and to said name resolution means for controlling the operation of said processor means and for providing said memory command including the address provided by said name resolution means to said memory means,

and wherein

the operation performed by said system include

(A) a call operation which suspends the execution of the current sequence of instructions by said processor means and begins the execution of another sequence of instructions, and

(B) a return operation which terminates the execution of said another sequence of instructions and resumes said suspended execution,

and a currently used architectural base address can only be changed as a result of said call operations and said return operations.

4,514,801

MICROCOMPUTER WITH TABLE-READ AND TABLE-WRITE INSTRUCTIONS

Edward R. Caudel, Houston; Gary L. Swoboda, Austin; Surendar S. Magar, Houston; Kevin C. McDonough, Houston, and Antony W. Leigh, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,954

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **12 Claims**

1. A microcomputer device comprising:

an arithmetic/logic unit having data input and an accumulator data output;

a data memory having an address input and having data input/output means;

data bus means coupled to the data input and accumulator data output of the arithmetic/logic unit and coupled to the data input/output means of the data memory;

a program memory having an address input and having an instruction output, the program memory storing instruction words;

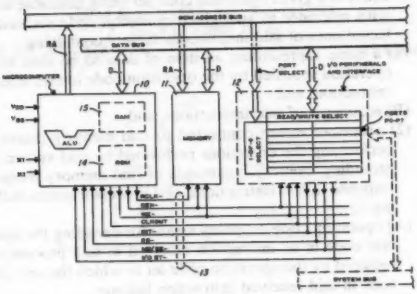
program address means connected to the address input of the program memory means;

control means for generating controls in response to instruction words, the controls defining operation of the arithmetic/logic unit and transfer to and from the bus means;

program bus means coupled to said instruction output, to said control means, and to said program address means;

bus interchange means for transferring the contents of the data bus means to the program bus means, and for transferring the contents of the program bus means to the data bus means,

the control means providing a table-read instruction employing said bus interchange means to transfer a table address from the accumulator output of the arithmetic/logic unit via the data bus means and the program bus means to the program address means to thereby address the program memory and in the same operating sequence defined by a table-read instruction word to transfer data from the instruction output of the program memory via the program bus means to the data bus means.

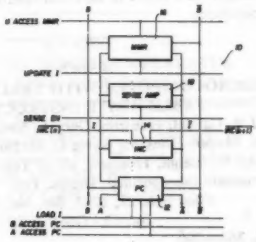


4,514,802

INTEGRATED PROGRAM COUNTER MEMORY MANAGEMENT REGISTER AND INCREMENTER

Paul Cohen, Ashland, Mass., and William R. Young, Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 31, 1982, Ser. No. 363,815
Int. Cl.³ G06F 9/32
U.S. Cl. 364—200 **13 Claims**



1. An integrated program counter, memory and incrementer cell comprising:

program counter means;

memory storage means;

a first data bus means connected to said program counter means and said memory storage means for providing external access to said program counter means and said memory storage means;

second data bus means connected to said program counter means and said memory storage means for providing access to said program counter means for reading and to said memory storage means for writing;

sense means connected to said second data bus means for sensing a logic value of said program counter means on said second data bus means and maintaining said logic value on said second bus means; and

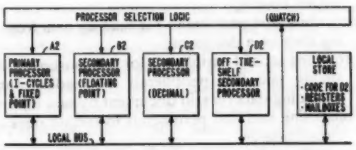
increment means, connected to said second bus means and said program counter means and having an input increment terminal, for reading said logic value on said second data bus means and writing an incremented logic value in said program counter means when said program counter means is disconnected from said second data bus means in response to an increment signal on said increment signal input terminal.

4,514,803

METHODS FOR PARTITIONING MAINFRAME INSTRUCTION SETS TO IMPLEMENT MICROPROCESSOR BASED EMULATION THEREOF

Palmer W. Agnew, Owego; Joseph P. Buonomo, Endicott; Steven R. Houghtalen, Endicott; Anne S. Kellerman, Endicott; Raymond E. Losinger, Endicott, and James W. Valashinas, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,634
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **27 Claims**



1. A method for microprocessor implemented emulation of a mainframe computer, using a plurality of large scale integrated chip microprocessors, said main frame computer having a predefined instruction set and a set of general purpose registers associated therewith, said method comprising the steps of:

(a) partitioning the instruction set of said mainframe computer into a plurality of subsets of enabling microcode, the enabling microcode of at least one of which subsets completely fits on and is entirely executable by and on a single said chip microprocessor;

(b) providing chip based microprocessors on which said instruction set subsets are implemented, thus enabling each of said microprocessors capable of supporting said on-chip microcode;

(c) providing each microprocessor with all of the necessary microcode to allow implementation and control execution of its resident subset instructions entirely on-chip;

(d) providing at least one path between all of said microprocessors via which control can be passed back and forth between said microprocessors; and

(e) providing at least one path between all of said microprocessors via which data can be passed back and forth between said microprocessors.

4,514,804

INFORMATION HANDLING APPARATUS HAVING A HIGH SPEED INSTRUCTION-EXECUTING FUNCTION

Manabu Kimoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 324,787
Int. Cl.³ G06F 9/00
U.S. Cl. 364—200 **2 Claims**

1. Improvement in means for reading memory contents and executing instruction in an information handling apparatus, comprising:

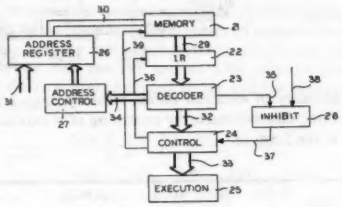
memory means for storing a plurality of instructions, includ-

ing a skip instruction, an instruction following said skip instruction being comprised of a plurality of bytes;

addressing means coupled to said memory means for reading a first single byte of an instruction out of said memory means responsive to sequential byte addresses;

decoding means coupled to said memory means for decoding the instructions which have been read out of said memory means responsive to said addressing means in order to output a plurality of decoded signals;

means coupled to said decoding means for producing at least one control signal in response to said decoded signals, said addressing means receiving the control signal and advancing to a new address where a next single byte is read out following the previously last read out single byte which



was read from said memory in response to said control signal;

generating means coupled to said decoding means and being responsive to said next signal byte for generating a skip signal designating a skip operation when said next single byte is decoded by said decoding means and found to be said skip instruction; and

means coupled to said generating means and operated responsive to said skip signal for producing a next address designating a next instruction which is immediately subsequent to said instruction following said skip instruction, said next address being produced by adding the byte address next following said new address, which designates said skip instruction, to the number of bytes of said instruction following said skip instruction.

4,514,805

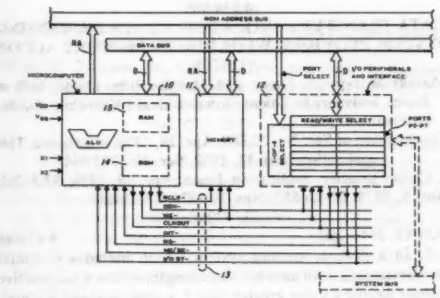
INTERRUPT OPERATION IN SYSTEMS EMULATOR MODE FOR MICROCOMPUTER

Kevin C. McDonough, Houston; Gary L. Swoboda, Austin, and Surendar S. Magar, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,955

Int. Cl.³ G06F *9/26*

U.S. Cl. 364—200 **4 Claims**



1. A microcomputer system comprising:

a microcomputer device formed in a single integrated circuit and having data input/output terminals, address output terminals, a pair of voltage supply terminals receiving a supply voltage of a given level, and control terminals including a mode control terminal; the microcomputer device having an arithmetic/logic unit, a data memory, an internal program memory, and control means; the microcomputer device being operated by logic voltages on said data input/output terminals and said control terminals of about said given level;

program memory means external to the microcomputer device having an address input operated by address voltages of about said given level and having data output means;

input/output peripheral means for transfer of information to or from external equipment including application of selected voltages to said mode control terminal; said information being voltages of about said given level; said selected voltages being voltages of said given level and also an interrupt voltage at a level substantially above said given level;

external address bus means coupled to the address output terminals of the microcomputer device and to the address input of the external program memory means;

external data bus means coupled to the data input/output terminals of the microcomputer device and to the data output means of the external program memory means;

said data memory having an address input and having data input/output means;

said internal program memory having an address input and having an instruction output, the internal program memory storing instruction words;

program address means within the microcomputer device connected to the address input of said internal program memory;

said control means generating controls in response to instruction words, the controls defining operation of the arithmetic/logic unit and transfer to and from internal bus means;

internal bus means coupled to the data input and data output of the arithmetic/logic unit, to the data input/output means of the data memory, to said instruction output of the internal program memory, to said control means, to said address output terminals, to said data input/output terminals, and to said program address means;

mode switching means within the microcomputer device to apply program addresses either to said program address means of the internal program memory or to said address output terminals for transfer via said external address bus means to the external program memory means, the mode switching means being operated by voltages of said given level and not exceeding said given level on by the mode control terminal, and

interrupt means coupled to the mode switching means and responsive to said interrupt voltage on the mode control terminal at said level substantially above said given level to cause a non-maskable interrupt wherein a fixed vector address is applied to said program address means and an existing program address is saved.

4,514,806

HIGH SPEED LINK CONTROLLER WRAPAROUND TEST LOGIC

Kent H. Hartig, Hudson, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1982, Ser. No. 431,860

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **6 Claims**

1. Apparatus for testing the logic of a high speed link controller comprising:

memory means for storing a microprogram;

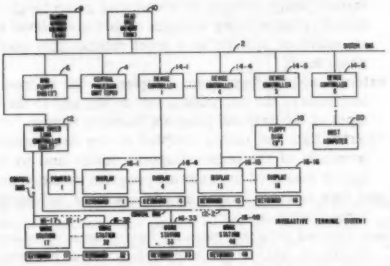
microprocessor means coupled to said memory means and responsive to memory signals indicative of a plurality of microwords of said microprogram for generating a plural-

ity of address signals, a first plurality of data signals, and a plurality of control signals;

wraparound test control means coupled to said microprocessor means and responsive to said plurality of address signals for generating a first wrap test signal;

communications controller means coupled to said microprocessor means and responsive to said plurality of control signals for serializing said first plurality of data signals into a first sequence of serial data signals, said communications controller further generating a cyclic receive clock signal timed in synchronization with said first sequence of serial data signals;

receiving means coupled to said communications controller and responsive to said cyclic receive clock signal and said first sequence of serial data signals for generating a sequence of first signals and a sequence of second signals representative of said first sequence of serial data signals; and



synchronization means coupled to said receiving means and said wraparound test control means and responsive to said first wrap test signal and said first sequence of signals and said second sequence of signals for generating a second sequence of serial data signals;

said communications controller being coupled to said synchronization means and responsive to said second sequence of data signals for generating a second plurality of data signals;

said microprocessor means receiving said second plurality of data signals for verifying that said second plurality of data signals corresponds to said first plurality of data signals.

4,514,807

PARALLEL COMPUTER

Tatsuo Nogi, Mibugawadanchi 129,29-1 Mibugawacho, Chudoji, Shimogyo-ku, Kyoto, Japan

Continuation of Ser. No. 263,603, May 14, 1981,. This application Feb. 13, 1984, Ser. No. 579,545

Claims priority, application Japan, May 21, 1980, 55-68044

Int. Cl.[3] G06F *3/04, 15/16*

U.S. Cl. 364—200 **2 Claims**

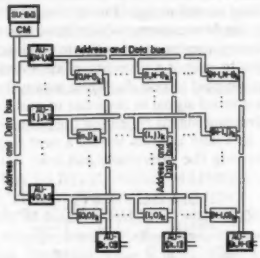
1. A multiprocessor parallel computer system comprising:

a control computer system;

a plurality of identical slave processors arranged in an N by N matrix in the form of

AU-((0,0)), AU-((0,1)), . . . , AU-((0,N-1))
AU-((1,0)), Au-((1,1)), . . . , AU-((1,N-1))
. . . AU-((j,k)) . . .
. . . AU-((k,i)) . . .
AU-((N-1,0)), AU-((N-1,1)), . . . , AU-((N-1,N-1))

where N is an integer selected to be greater than one, and where AU-((j,k)) is the slave processor located in the jth row and kth column of said N by N matrix, each row of N of said slave processors being connected to said control computer system through a separate bus serving said row of N slave processors; and



a plurality of identical buffer memory units arranged in a three-dimensional array consisting of N matricies, N by N, in the form of

$(0,0)_k$; $(0,1)_k$; . . . ; $(0,N-1)_k$
$(1,0)_k$; $(1,1)_k$; . . . ; $(1,N-1)_k$
. . . $(i,j)_k$ . . .
. . . $(j,i)_k$ . . .
$(N-1,0)_k$; $(N-1,1)_k$; . . . ; $(N-1,N-1)_k$

where the index k=0, 1, 2, . . . , N−1 is an array number, and where any buffer memory unit $(i,j)_k$ located in the jth column and the ith row of the kth matrix of said N by N memory matricies, and every buffer memory unit on the ith row, $(i,j)_k$ (j=0,1, . . . , N−1) is interconnected to the processor AU-((k,i)) via a corresponding common 'row' bus, while every unit on the jth column, $(i,j)_k$ (i=0,1,2, . . . , N−1) is interconnected to the processor AU-((j,k)) via a corresponding common 'column' bus; and where any two processors with the same index k, said AU-((k,i)) and said AU((j,k)), can transfer data to one another through the buffer memory unit $(i,j)_k$, and any two slave processors, AU-((l,m)) and said AU-((j,k)), not directly interconnected by a corresponding buffer memory unit, transfer data to one another through either of two mediation slave processors, AU-((m,j)) or AU-((k,l)), said slave processors AU-((m,j)) and AU-((k,l)) being interconnected to said slave processor AU-((l,m)) through corresponding buffer memory units $(j,l)_m$ and $(m,k)_l$, respectively, and to said processor AU-((j,k)), through corresponding buffer memory units, $(k,m)_j$ and $(l,j)_k$, respectively.

4,514,808

DATA TRANSFER SYSTEM FOR A DATA PROCESSING SYSTEM PROVIDED WITH DIRECT MEMORY ACCESS UNITS

Masaki Murayama, Fussa, and Manjiro Iida, Oume, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 32,880, Apr. 24, 1979, abandoned. This application May 11, 1982, Ser. No. 377,044

Claims priority, application Japan, Apr. 28, 1978, 53-50082; Nov. 8, 1978, 53-136657; Nov. 8, 1978, 53-136658

Int. Cl.[3] G06F *3/04*

U.S. Cl. 364—200 **6 Claims**

1. In a data processing system which includes a central processing unit with an n-bit word length, where n is a positive integer having a value greater than 7, a main memory, a plurality of direct memory access units and an n-bit data bus coupling the central processing unit, the main memory and the direct memory access units for transfer of data between the direct memory access units and the main memory, the improvement

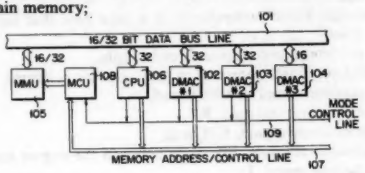
comprising a data transfer system for accessing the main memory, the data transfer system comprising:

(a) said main memory being capable of storing n-bit full-words in byte units, each full-word made up of m bytes where n/m is the number of bits in one byte and said memory having a separate transfer enable input for each of said m bytes;

(b) said direct memory access units comprising at least one first direct memory access unit which can receive and deliver n-bit full-words, and at least one second direct memory access unit which can receive and deliver n/2 bit half-words, since n/2 is an integer;

(c) a plurality of gate circuits coupling the main memory and the data bus line;

(d) first data transfer control means for controlling the gate circuits so that data transfer is achieved between the main memory and the first direct memory access unit, using n bits of the data bus line and an n-bit memory location when the first direct memory access unit has access to the main memory;



(e) zone specifying means having m zone selection inputs from the Central Processing unit, one corresponding to each of said m bytes in said main memory and responsive to said zone selection inputs and a control output from said first data transfer control means indicative of data transfer between the main memory and the first direct memory access unit, for selectively providing at least one signal to said separate transfer enable inputs to enable, transfer of at least one byte of data between an n-bit memory location and said first direct memory access unit using a corresponding part of the n-bit data bus line and the first direct memory access unit whereby through use of said zone specifying means appropriate zones within an n-bit full-word or a half-word may be specified; and

(f) second data transfer control means for controlling the gate circuits so that data transfer is achieved between the main memory and the second direct memory access unit, using n/2 bits of the data bus line and n/2 bits from an n bit memory location when the second direct memory access unit has access to the main memory.

4,514,809
DYNAMIC RANGE CONTROL OF ELECTRODE PAD CURRENT IN WELL LOGGING TOOLS

Wade M. Johnson, Jr., Cypress, Tex., and Jorg A. Angehrn, Brea, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 30, 1982, Ser. No. 373,776
Int. Cl.³ G01V *3/28*
U.S. Cl. 364—422 **30 Claims**

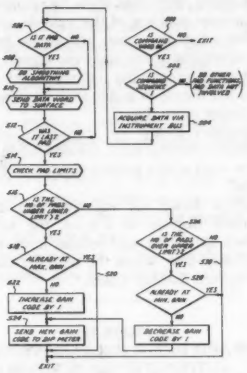
1. Well logging apparatus for investigating an earth formation, including apparatus for controlling the dynamic range of current flows established in the earth formation, comprising:

electrode means in electrical contact with said formation for establishing current flow in said formation,

circuit means in electrical contact with said formation for deriving a signal functionally related to the magnitude of said current flow,

comparator means interconnected with said circuit means for comparing said magnitude of said signal to a selected range of magnitudes; and

correction means interconnected between said electrode means and said comparator means for controlling the dynamic range of said current flow by adjusting said

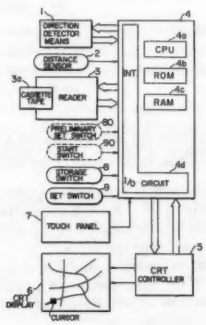


current flow as a function of said comparison derived by said comparator means.

4,514,810
NAVIGATOR FOR VEHICLES

Yoji Ito, Kariya; Yozo Inoue, Chiryu; Kiyoshi Hara, Oobu; Kazuo Muramoto, Ichinomiya, and Kunio Miura, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 15, 1982, Ser. No. 418,530
Claims priority, application Japan, Sep. 17, 1981, 56-147096; Sep. 22, 1981, 56-150189
Int. Cl.³ G06F *15/50*; G09B *29/10*
U.S. Cl. 364—424 **4 Claims**



1. A vehicle navigator for displaying a running track of the vehicle, comprising:

present position detector means for detecting the present position of the vehicle and outputting a present position signal corresponding to the present position of the vehicle;

first memory means for storing a plurality of original road maps indicative of running tracks of the vehicle, said first memory means selectively reading out map data corresponding to one of said plurality of original road maps in response to a control signal;

control means comprising:

first means for receiving said present position signal from said present position detector means, and for outputting said control signal to said first memory means in order to receive said map data, wherein said first means processes said received present position signal and said map

data to generate a display signal for displaying running route data of the vehicle on said map data;

second means for receiving and storing the map data and the running route data, including running track data and the present position of the vehicle, in response to said display signal from said first means and for generating corresponding video and sync signals;

display means for receiving said video and sync signals from said second means in order to display said map data and said running route data;

second memory means for storing as additional running track data a running track formed when the vehicle runs on a new road which is not indicated on the displayed map data; and

road addition means for allowing said display means to additionally display, as a road, the additional running track data stored by said second memory means on the selected map data, when the selected map data is re-displayed by said display means.

4,514,811

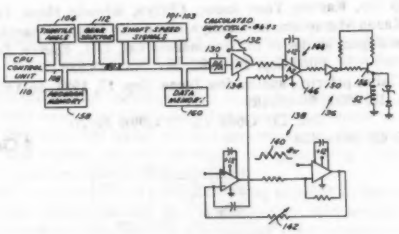
FORWARD DRIVE RELEASE SYSTEM FOR AUTOMATIC TRANSMISSION

John A. Daubenmier, Canton, and Elias T. Boueri, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 28, 1982, Ser. No. 393,208

Int. Cl.[3] **B60K** *41/28;* **G05B** *15/02;* **G05D** *17/02*

U.S. Cl. 364—424.1 **9 Claims**



1. A control system for controlling the magnitude of torque transmitted through a clutch of an automatic transmission comprising:

a throttle sensor which generates a signal that represents the throttle opening of a throttle controlled engine;

an engine speed sensor which detects a value that represents the engine rotational speed, NE;

a gear ratio sensor which generates a signal that represents disposition of the gear selector in a forward drive position;

a shaft speed sensor which generates a signal that represents the speed of the vehicle;

a torque converter having an impeller drivably connected to the engine crankshaft and a turbine driven from the impeller;

a turbine speed sensor which generates a value that represents the turbine speed, NT;

a solenoid operated valve that opens and closes communication between a source of pressurized fluid and the clutch and between atmosphere and the clutch, thereby pressurizing and venting the clutch as the solenoid windings are energized and deenergized;

computing means for repetitively computing the duty cycle of the solenoid provided the gear ratio selector is disposed and in an acceptable forward drive position, the throttle setting is equal to or less than a predetermined setting and the vehicle speed is equal to or less than a predetermined speed, having a data base that includes the values of the proportional gain, KP, the derivative gain, KD, and the desired absolute difference between engine speed and turbine speed, L, adapted to repetitively calculate current instantaneous speed difference values $|NE-NT|_c$ to store in memory and recall from memory previously calculated instantaneous speed difference values $|NE-NT|_p$ and previously calculated duty cycle values, DC_p, and to repetitively calculate the current duty cycle, DC_c from the relationship

$$DC_c = DC_p - KP(|NE-NT|_c - L) - KD(-|NE-NT|_c - |NE-NT|_p);$$

and

means for converting the binary value of the current duty cycle to an analog current that energizes the solenoid.

6. A method for controlling with the aid of a digital computer the magnitude of torque transmitted between a throttle engine and an output shaft through a clutch of an automatic transmission having a torque converter turbine and a solenoid valve that operates to engage and disengage the clutch comprising:

providing said computer with a data base that includes at least

a predetermined engine throttle angle,

predetermined transmission gear selector positions,

a predetermined vehicle speed,

the proportional gain, KP,

the derivative gain, KD, and

a desired absolute difference between the engine speed and turbine speed, L;

continually determining and providing the computer with the current throttle opening of the engine, the current speeds of the engine, turbine and vehicle, the current setting of the gear selector and the speeds of the engine and turbine that were determined during a previous computing period;

executing the following steps provided the gear selector is set at one of the predetermined gear selector positions and the throttle angle is equal to or less than the predetermined throttle angle and the vehicle speed is equal to or less than the predetermined vehicle speed;

repetively calculating in the computer at frequent periodic intervals the equation:

$$DC_c = DC_p - KP(|NE-NT|_c - L) - KD(-|NE-NT|_c - |NE-NT|_p)$$

where

DC_c and DC_p are the current duty cycle and previous duty cycle calculated during a previous computing period;

converting the calculated current duty cycle to a voltage pulse wave; and

energizing the solenoid valve by applying the voltage pulse wave to the windings of the solenoid.

4,514,812

METHOD AND APPARATUS FOR CONTROLLING THE THICKNESS OF A LAMINA OF A COEXTRUDED LAMINATE

Peter S. Miller, Waterville, and Maclin S. Hall, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 27, 1982, Ser. No. 424,686

Int. Cl.[3] **G06F** *15/46;* **G06G** *7/64;* **B28B** *17/00;* **B28** *00/00*

U.S. Cl. 364—473 **19 Claims**

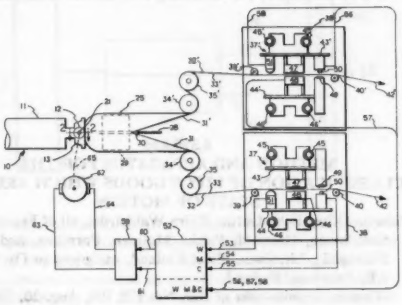
1. Apparatus for controlling the average thickness ($\bar{T}_1$) of a film lamina of thermoplastic material having a known density (D_1) and coextruded at a variable extrusion rate with a foam lamina of similar thermoplastic material having a thickness (T_2) and a density (D_2) to form a thermoplastic laminate comprising:

a first gauge for sensing the thickness of the laminate which is equal to (T_1+T_2) and for providing a caliper signal (C) corresponding to the thickness sensed;

a second gauge for sensing the mass/unit-area of the laminate which is equal to $(T_1)(D_1)+(T_2)(D_2)$ and for provid-

ing a mass signal (M) corresponding to the mass/unit-area sensed;

a third gauge for sensing a response to said thermoplastic material and its distribution in the laminate and for providing a dielectric signal (W) corresponding to the response which is equal to $[(a)(T_1)/(b+\quad)][K-(D_2/D_1)]$ where (K) is a ratio of the dielectric effect of the solid material in each lamina and (a) and (b) are coefficients approximated to best fit empirical data measured by said gauge, said gauge being positioned adjacent the film lamina and the



sensitivity of said gauge decreasing with the distance therefrom;

a computer having a memory containing the value of the density (D_1) of the film lamina, the value of the ratio (K) and the values of the coefficients (a) and (b), said computer being connected to said first, second, and third gauges and being responsive to successive sets of signals comprising the caliper signal (C), the mass signal (M) and the dielectric signal (W) for calculating the thickness (T_1) of the film lamina according to the formula:

$$T_1 = \frac{(b)[aM - WD_1(b + C)]}{WD_1(b + C) + aD_1(b - Kb - KC)}$$

combined from the equalities associated with each signal received, and then for comparing an average thickness ($\bar{T}_1$) of the calculated thicknesses (T_1) to a desired thickness (T_0) and providing a first control signal (DEC) when the average thickness ($\bar{T}_1$) is greater than the desired thickness (T_0) and a second control signal (INC) when the average thickness ($\bar{T}_1$) is less than the desired thickness (T_0); and

means connected to said computer and responsive to the first control signal (DEC) for decreasing the extrusion rate of the film lamina and responsive to the second control signal (INC) for increasing the extrusion rate of the film lamina.

4,514,813

SYSTEM FOR CORRECTING POSITIONAL ERROR IN NUMERICAL CONTROL DEVICES

Ryoichiro Nozawa, Tokyo, and Hideaki Kawamura, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Sep. 25, 1981, Ser. No. 305,785

Int. Cl.³ G06F *15/46, 11/00;* G05B *19/24*

U.S. Cl. 364—474 **8 Claims**

1. A method of correcting a positional error in a numerical control system, with a memory, for controlling a machine tool having a movable member with a commanded position and movable in three dimensional space and having at least two control axes, the movable member being movable along at least two of said control axes and the movement of the member being controlled along at least two of said control axes, said method comprising the steps of:

(a) dividing the three dimensional space, in which the movable member moves, for each of said at least two control axes, into corresponding pluralities of sub-regions;

(b) storing in the memory a position correcting value derived from the position of the movable member along at least one other control axis for each of said sub-regions;

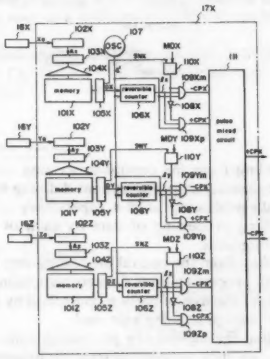
(c) up-dating the commanded position of the movable member each time the movable member moves;

(d) detecting when the current position of the movable member has shifted from one sub-region of space to a second sub-region of space;

(e) storing the position correcting value of said one sub-region of space which the movable member has just moved from;

(f) reading out of the memory the position correcting value corresponding to said second sub-region of space when the current position of the movable member is located in said second sub-region; and

(g) correcting the position of the movable member along said one control axis in accordance with the arithmetic



difference between the position correcting value of the second sub-region of space and the stored position correcting value of the one sub-region of space the movable member has just moved from.

3. A position error correction apparatus in a numerical control system for controlling a machine tool having a movable member movable along at least two axes and whose movement is controlled along at least two control axes, said apparatus including:

error correction circuits, each associated with a corresponding one of said control axes and generating corresponding correction factors in accordance with correctional values associated with the position of the movable member along one control axis, and correctional values associated with the position of the movable member along at least one other control axis, said error correction circuits providing corresponding output signals indicative of the corresponding correction factors, in response to a positional control operation along one of said control axes, and for correcting the positional error of the movable member.

4,514,814

MULTI-PROCESSOR AXIS CONTROL

John T. Evans, Waynesboro, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Sep. 7, 1982, Ser. No. 415,507

Int. Cl.³ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—474 **6 Claims**

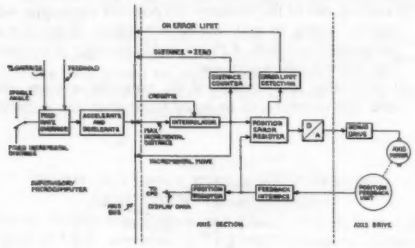
MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 78 Pages)

1. A method for operating a computer numerical control (CNC) system for controlling an industrial machine system having a plurality of controllable axes of motion, the CNC

system including a central processing unit, a plurality of supervisory processing units, a plurality of axis data processing units, input means for providing preliminary set-up data to the CNC system and communication bus means for providing communication between the processing units and the machine system, each of the axis data processing units being assigned to control a predetermined one of the axes of motion said method comprising the steps of:

(a) providing data to each of the supervisory processing units defining a mode of operation for a group of axes of motion of the machine system to be controlled by a corresponding one of the supervisory processing units;



(b) providing from the central processing unit to the axis data processing units instructions defining for each of the axis data processing units a supervisory processing unit controlling processing of data by each of the axis data processing units;

(c) providing from the central processing unit to each of the axis data processing units data corresponding to a desired motion for the axis of motion controlled by a corresponding axis data processing unit; and

(d) directing the supervisory processing units to force each of the axis data processing units to process the desired motion data whereby signals are provided from the axis data processing units to the machine system to cause the desired motion.

4,514,815

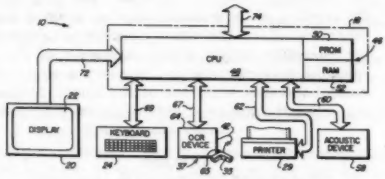
COMPUTERIZED SYSTEM AND METHOD OF MATERIAL CONTROL

Nils A. Anderson, Paradise Valley, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 61,124, Jul. 27, 1979, abandoned. This application Nov. 27, 1981, Ser. No. 325,377

Int. Cl.³ G06F *15/24*

U.S. Cl. 364—478 **8 Claims**



4. A system of material control for a plurality of articles, an initial OCR readable label associated with each article and having an alphanumeric character field disposed thereon representing the nature of the article,

a. a plurality of OCR devices, each OCR device reading alphanumeric characters and producing an electronic representation of each character read, at least one OCR device reading said initial labels;

b. a computer receiving and storing as data said electronic representation from each OCR device, said computer generating a unique identifying indicia for said article in response to said one OCR device reading said associated initial label and for storing said indicia conjunctive with the nature thereof;

c. a printer receiving said indicia from said computer to print said indica in response thereto onto another OCR readable label to be read by at least one OCR device;

d. a keyboard for entering data and instruction to said computer; and

e. a visual display for exhibiting information from said computer.

4,514,816

METHOD AND APPARATUS FOR THE CLASSIFICATION OF PIECE GOODS WHICH ARE IN A STATE OF MOTION

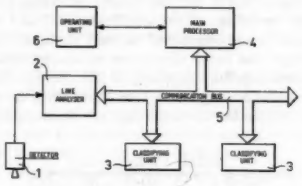
Martin Ollus; Esko Uotila; Björn Wahlström, all of Espoo; Esko Saukkonen, Helsinki; Pekka Malinen, Parainen, and Immo Mäenpää , Littoinen, all of Finland, assignors to Oy Partek AB, Parainen, Finland

Continuation-in-part of Ser. No. 179,780, Aug. 20, 1980, abandoned. This application Aug. 1, 1983, Ser. No. 518,974

Claims priority, application Finland, Aug. 22, 1979, 792621

Int. Cl.³ B07C *5/34*

U.S. Cl. 364—478 **10 Claims**



10. Apparatus for the identification and classification, on the basis of a physical property, of pieces which are randomly distributed without touching one another and in a state of continuous translatory movement on a background having an intensity of the physical property which is sufficiently different from that of the pieces being identified to enable the perimeters of the pieces to be identified, the said apparatus comprising:

a detector scanning transversely the travel path of the pieces and generating a variable electric signal corresponding to the observed physical quantity;

an analyzer for converting the said variable electric signal into a key number group for each piece on the scan line of the detector, each said key number group comprising N key numbers being representative of the marginal positions of that piece on the scan line and other selected characteristics of the piece; a plurality of microprocessors for carrying out the classifying of the pieces on the basis of said N key numbers;

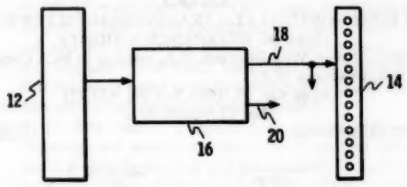
each of which microprocessors is connected for carrying out the classifying operation as a recursive processing of the information on a particular one of the pieces being classified;

and a main processor for receiving data from the said microprocessors and to control said microprocessors in such a manner that, immediately upon having carried out the classification of one said piece, each microprocessor is reset and subsequently assigned for the classification of a further piece arriving at the scan line and situated arbitrarily in the travel path across the scan line.

4,514,817
POSITION SENSING AND INDICATING DEVICE

Robert B. Pepper, 1539 McAllister St., San Francisco, Calif. 94115, and James A. Maples, Palo Alto, Calif., assignors to Robert B. Pepper, San Francisco, Calif.

Continuation-in-part of Ser. No. 18,411, Mar. 7, 1979, Pat. No. 4,270,171. This application Feb. 10, 1981, Ser. No. 233,000
Int. Cl.³ H05B *39/00*
U.S. Cl. 364—480 27 Claims



20. In an automated control system having programmed control means for controlling the level of a utilization device connected thereto, a manual override control comprising:

display means connected to the programmed control means for displaying the current level of the utilization device under control;

an actuating device;

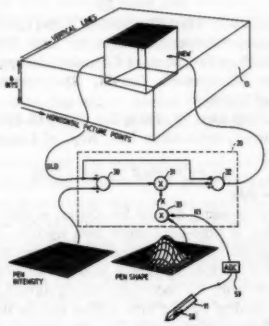
a control panel sensitive to the proximity and position of the actuating device;

circuit means connected to the display means and the control panel for detecting the proximity of the actuating device to the control panel for producing a first signal to cause the program control means to interrupt program control of the level of the utilization device, and for determining the position of the actuating device when it is brought into proximity with the control panel and producing a second signal to establish the level of the utilization device in response to the position of the actuating device.

4,514,818
VIDEO IMAGE CREATION SYSTEM WHICH SIMULATES DRAFTING TOOL

Ian C. Walker, Newbury, England, assignor to Quantel Limited, Berkshire, England

Filed Dec. 1, 1981, Ser. No. 326,293
Claims priority, application United Kingdom, Dec. 4, 1980, 8038887
Int. Cl.³ H04N *1/22;* G09G *1/16*
U.S. Cl. 364—521 19 Claims



1. A video image creation system comprising:

drafting means operable by an operator to designate positions on a desired line in the image;

means for providing shape signals relating to a patch of image points, said shape signals having different values to simulate the distribution of drafting medium produced by a notional drafting tool;

a store for picture point signals having storage locations representing points of the image;

processing means responsive to operation of said drafting means for producing for each designated position of group of image signals which are a function of said shape signals;

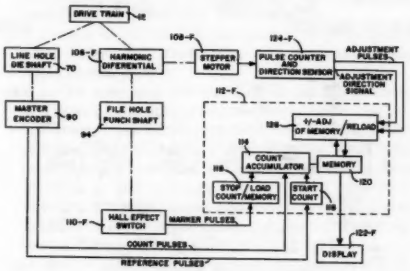
means for storing said image signals at storage locations of said store determined by the designated position and by the position of the image points in said patch; and

means for reading signals from said store to produce a sequence of signals adapted for the reproduction of the image.

4,514,819
APPARATUS AND METHOD FOR MEASURING ROTATIONAL POSITION

Dinesh G. Punater, Dayton, and Donald G. Bastian, Centerville, both of Ohio, assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Jun. 4, 1982, Ser. No. 385,209
Int. Cl.³ G06F *15/46;* G06G *7/64, 7/66*
U.S. Cl. 364—556 14 Claims



1. An apparatus for measuring with respect to a first rotating element the circumferential setting of a second rotating element of a machine for operating on a moving web, said first and second elements being connected to a drive train for selective and simultaneous driving thereby at a common rotational speed, comprising:

means driven in synchronism with said first element for generating an electrical signal including one reference trigger pulse for each revolution of said first element with respect to a fixed point of said machine, and an electric signal including a train of count pulses, one each of said count pulses being generated in response to rotation of said first element through a predetermined increment;

means cooperating with said second rotating element for generating an electric signal including one marker trigger pulse for each revolution of said second element with respect to a fixed point of said machine;

means for receiving said reference pulses, said count pulses and said marker pulses, and for counting the number of said count pulses received subsequent to receipt of one of said trigger pulses and up to and simultaneous with receipt of the first succeeding one of the other of said trigger pulses;

said pulse receiving and counting means including a memory for retaining therein said number of said count pulses until receipt by said receiving and counting means of the second succeeding one of said other trigger pulses;

means for selectively adjusting the circumferential setting of said second rotating element with respect to said first rotating element; and

means for generating an electric signal including adjustment

pulses, a predetermined number of said adjustment pulses being generated in response to adjustment of said second element by said adjustment means through said increment of rotation corresponding to one of said count pulses;

said pulse receiving and counting means receiving said adjustment pulses, and modifying said number of said count pulses retained within said memory by the number of said adjustment pulses, divided by said predetermined number, received subsequent to receipt of said first other trigger pulse and up to and simultaneous with receipt of said second other trigger pulse;

said modifying of said number of said count pulses being made simultaneously with receipt of said adjustment pulses by said pulse receiving and counting means, whereby said number of said count pulses is representative of the current circumferential setting of said second element during times when driving of said first and second elements is stopped.

4,514,820

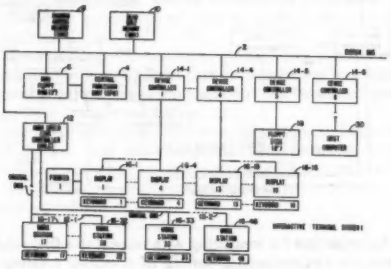
APPARATUS FOR GENERATING TRAPEZOIDAL SIGNALS OVER A SINGLE CONDUCTOR COAXIAL BUS

Fred A. Mirow, Westwood, and Matthew M. Quinones, Hollliston, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1982, Ser. No. 431,914

Int. Cl.³ G06F *15/16*; H03K *1/00*

U.S. Cl. 364—858 **5 Claims**



1. An interactive terminal data processing system includes a high speed link controller (HSLC) and a plurality of work stations, all coupled in common to a single conductor coaxial bus for transferring information between said HSLC and said plurality of work stations, said HSLC includes a communications controller for generating serial data signals, data recovery logic for converting each of said serial data signals representative of a ZERO data bit to a sequence of first signals, each first signal having a rectangular waveshape, and a sequence of second signals alternating between a first state and a second state for successive first signals of the sequence of first signals, analog logic responsive to the sequence of first signals and the sequence of second signals in the first and the second states for generating a sequence of third signals alternating between a positive trapezoidal waveshape and a negative trapezoidal waveshape for reducing noise and reflections over said coaxial bus, said analog logic comprising:

first means responsive to the rise of the each first signal for generating a first ramp voltage signal rising to a first predetermined voltage, and responsive to the fall of the each first signal for generating the first ramp voltage signal falling to a second predetermined voltage, the ramp voltage signal having a positive trapezoidal waveshape;

second means responsive to the ramp voltage signal and each of the sequence of second signals in the first state for generating a third signal having a positive trapezoidal waveshape, and responsive to the ramp voltage signal and one of the sequence of second signals in the second state for generating the third having having a negative trapezoidal waveshape;

wherein said first means being responsive to the sequence of first signals for generating a sequence of ramp voltage signals; and

the second means being responsive to the sequence of second signals and the sequence of ramp voltage signals for generating the sequence of third signals.

4,514,821

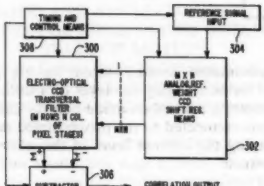
ELECTRO-OPTICAL CCD TRANSVERSAL FILTER WITH ANALOG REFERENCE WEIGHTS

John R. Tower, West Deptford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,231

Int. Cl.³ G06G *7/19*

U.S. Cl. 364—862 **12 Claims**



1. In combination:

a monolithic electro-optical charge coupled device (CCD) transversal filter and analog reference weight CCD shift register means for said transversal filter;

said transversal filter being comprised of a predetermined number of pixel stages, each of which includes an imager pixel; and

said shift register means including a separate shift register stage corresponding to each one of said predetermined number of pixel stages, with each separate shift register stage being situated in cooperative relationship with its corresponding pixel stage, so that said shift register means can forward each of respective selected analog reference weight signals to the proper one of the respective pixel stages of said transversal filter, thereby to selectively control the filter characteristics of said transversal filter in accordance with said selected analog reference weight signals.

4,514,822

DEVICE FOR DATA ACQUISITION

Lutz Schneider, Malsch-Völkersbach, and Bruno Guigas, Bruchsal, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,406

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041219

Int. Cl.³ G06F *15/42, 13/00*

U.S. Cl. 364—900 **4 Claims**

1. A data processing device for digital acquisition, storage and processing of time-dependent data signals, especially for the accumulation of interferograms delivered by spin resonance and infrared spectrometers, said device comprising

an A/D converter for receiving analog signals and converting said analog signals into digital signals including successive data words;

a main memory with random access and having a plurality of address locations for storing blocks of the data words;

a disk storage device affording additional storage for the blocks of the data words;

a first data channel for transmitting the data words between the A/D converter and the main memory;

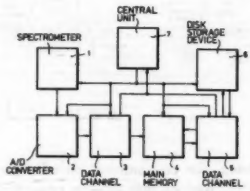
said first data channel including a pointer register for receiving and registering a sequence of address locations and for directing the data words to said sequence of address locations in the main memory;

said pointer register being adapted to be advanced along said sequence upon receiving a first reloading signal;

said first data channel including a word counter for initially receiving a desired word count value as to the number of words to be included in each block and for counting the number of data words transmitted by said first data channel and for producing the first reloading signal upon reaching said word count value and for supplying said first reloading signal to said pointer register for advancing said pointer register along said sequence;

said fist data channel comprising an address register for receiving and storing the sequence of address locations and for initially loading and subsequently reloading the sequence of address locations into said pointer register and for receiving an address reloading signal for causing said reloading of the sequence of address locations;

said first data channel including a block length register for initially receiving and storing the desired word count value as to the number of data words to be included in each data block and for initially loading said word count value into said word counter and for receiving the first



reloading signal from said word counter and for thereupon reloading said word counter with said word count value;

said first data channel including a block counter for initially receiving block count information as to the number of word blocks to be transmitted by said first data channel and for counting the word blocks as they are transmitted by said first data channel and for supplying an address reloading signal to said address register as each block is counted and for producing a terminating signal upon reaching a block count corresponding to said block count information;

a second data channel connected between said main memory and said disk storage device for transmitting data words therebetween;

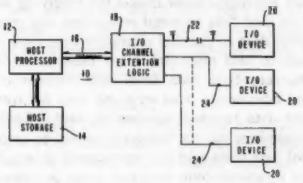
and a central unit for controlling said second data channel and for initially receiving program information as to said desired word count value and as to said block count information and as to said sequence of address locations and for initially loading said sequence of address locations into said address register and for initially loading said desired word count value into said block length register and for initially loading said block count information into said block counter and for initially starting the operation of said first data channel and for receiving said terminating signal and for terminating the transmission of data words by said first data channel in response to said terminating signal.

4,514,823

APPARATUS AND METHOD FOR EXTENDING A PARALLEL CHANNEL TO A SERIAL I/O DEVICE

Richard N. Mendelson; Douglas M. O'Neal, and Leo A. Sharp, Jr., all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,525
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—900 **11 Claims**



1. A method of serially extending a parallel channel from a host processor to an I/O device, comprising the steps of:

channel extension logic storing a command generated by the host processor;

said channel extension logic generating a command frame manifesting the stored command and control information identifying the frame as a host command;

said channel extension logic serializing the generated command frame and transmitting said serialized command frame to said device;

said device analyzing said transmitted command frame and said device generating a response frame, including control information, manifesting one of either that data defined by said response frame is to be directly transferred from the main storage of said host processor to the device, that data included in said response frame is to be directly transferred to said main storage of said host processor from said device, or that the execution of the command by the device has been terminated;

said device serializing the generated response frame and transmitting said serialized response frame to said channel extension logic;

in the event that said response frame manifests that data is to be transferred from said host memory to said device, said channel extension logic cycle stealing the data from said host memory, serializing said data, transmitting said serialized data to said device, and repeating from said step of analyzing;

in the event that said response frame from said device manifests that the data included in said response frame is to be stored in said host memory, said channel extension logic cycle stealing the data included in said response frame into said host memory; and

in the event that said response frame from said device manifests that the execution of the command by the device has been terminated, said channel extension logic awaiting another command generated by said host processor.

4,514,824

BYTE-ORIENTED LINE ADAPTER SYSTEM

Richard A. Loskorn; Philip D. Biehl, both of Dana Point, and Robert D. Catiller, Garden Grove, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 5, 1982, Ser. No. 355,135
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 **9 Claims**

1. In a line support processor for controlling data transfer operations between a host computer and data terminal equipment connected via data communication lines, wherein said line support processor includes a plurality of line adapters, a data link interface unit and a microprocessor means, said microprocessor means having an I/O bus for data transfers and

output control registers providing control data to each of said line adapters, a byte oriented line adapter system comprising:

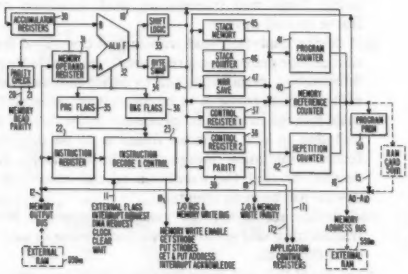
(a) a plurality of input/output circuit means connecting said data terminal equipment to a first driver switching means, and wherein said input/output circuit means can execute instructions from said microprocessor to operate synchronously or asynchronously during data transfer operations, each said input/output circuit means including:

(a1) a USART receiver-transmitter means controlled by said microprocessor means for receiving serial bit data from said data terminal equipment and converting said serial data to parallel character-byte data for transmission to said microprocessor means, and/or receiving character-byte data from said microprocessor means and converting it to serial bit data for transmission to said data terminal equipment, said USART receiver-transmitter means, being connected to respond to control data from said microprocessor means, for selecting the character-byte data size from five bits-per-byte up to eight bits-per-byte;

(a2) timing means, set by the said microprocessor means connected to said input/output circuit means, said timing means including:

(a2a) first timing means for generating the baud rate of data transfer in said USART receiver-transmitter means;

(a2b) second timing means connected to said microprocessor means for establishing programmed time-



out periods and delayed response time for accepting data coming in on said data communication lines to said line adapter;

(b) first driver switching means, controlled by said microprocessor means, for transferring data from said microprocessor means to a selected one of said input/output circuit means, or transferring data from said selected input/output circuit means to a multiplexor means;

(c) multiplexor means, having an output to said I/O bus of said microprocessor means, for conveying data bytes to a buffer memory means or to said microprocessor means for subsequent transfer to a main host computer, said multiplexor means including:

(c1) a group of n multiplexors, each multiplexor connected for conveying data from one bit-line of a data transfer bus means from said first driver switching means, said group of n multiplexors providing for parallel transfer of character bytes of up to eight bits;

(c2) said data transfer bus means connecting said first driver switching means to said multiplexor means;

(c3) a plurality of input information-data means connected to the input of each of said multiplexors, said information-data means being transferrable to said microprocessor means upon control instructions from said microprocessor means;

(c4) input instruction means connected to said multiplexor means from said microprocessor means for selecting which of said information-data means shall be transferred to said microprocessor means;

(d) buffer memory means, connected to said I/O bus, for temporarily buffering data being transferred between said microprocessor means and said data terminal equipment, said buffer memory means including:

(d1) address input lines connected from said microprocessor means to said memory means to receive addresses from said microprocessor means; and

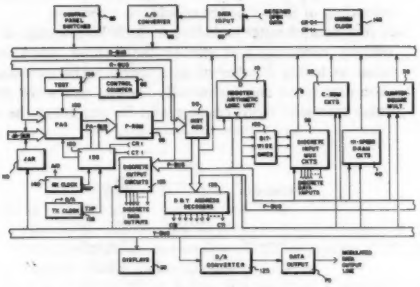
(d2) a memory output bus connected to convey addressed data from said memory means to said microprocessor means.

4,514,825

HIGH SPEED DIGITAL MODEM

Karl I. Nordling, Largo, Fla., assignor to Kinex Corporation, Largo, Fla.

Filed Mar. 9, 1982, Ser. No. 356,466
Int. Cl.³ G06F 7/44, 7/42
U.S. Cl. 364—900 **16 Claims**



1. In a modem for communication of digital data over a communications channel, said modem programmed to encode and decode data using 8 phase differential phase shift modulation, the improvement comprising:

(a) a modem processor (**10**, **90**, **95**, **100**, **120**, **20**, and **40**) including program memory means (**95**) having a control program stored therein and having a D-bus for input thereto of binary numbers in the form of bytes of digital data and a Y-bus for output therefrom of binary numbers in the form of bytes of digital data, said modem processor for performing logical addition and subtraction operations on such bytes of data;

(b) multiplying means (**30**) connected to said program memory means for performing high speed multiplication of a first binary number A and a second binary number B, said multiplier having a squares register (**38**), a squares memory table stored in a squares read only memory (**35**), an adder (**36**)/subtractor (**39**), and an accumulator (**37**), said squares register connected to said Y-bus for receiving in a first operation the sum A+B and in a second operation the difference A−B from said modem processor, said squares memory table receiving first said sum as address to the stored square thereof, said accumulator receiving said square, and in a second operation, said squares memory receiving said difference as an address to the stored square thereof, said adder/subtractor adding the negative of said square to the square stored in said accumulator, said accumulator thereafter producing a calculation of one-fourth the difference between said squares, said calculation being equal to the product of said first number A and said second number B, and said accumulator outputting said product onto said D-bus to said modem processor;

(c) bitwise logic circuit means (**150**) having a plurality of data byte inputs from said Y-bus and a single output for each one of said data byte inputs; and

(d) discrete-input multiplexer means (**50**) connected to said program memory means having a plurality of single-bit inputs connected to said single outputs of said bitwise logic circuit means for receiving individual single data bits therefrom selected by said program memory means, said multiplexer means having a parallel byte output to said D-bus wherein said multiplexer means outputs a parallel data byte for each selected single input data bit in which each bit of the parallel data byte has the same logic level as the selected single input data bit thereby allowing the processor to sense the state of the selected input data bit and any bit of such output data byte;

whereby said modem processor performs logic operations on bits within a byte and on a bit in one location in one byte with a bit in another location in another byte within said processor.

4,514,826

RELATIONAL ALGEBRA ENGINE

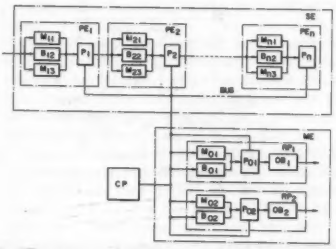
Kazuhide Iwata; Shigeki Shibayama, both of Yokohama; Yutaka Hidai, and Shigeru Oyanagi, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 2, 1982, Ser. No. 364,872

Claims priority, application Japan, May 18, 1981, 56-74564; May 18, 1981, 56-74565

Int. Cl.³ G06F *7/24, 7/02*

U.S. Cl. 364—900 **6 Claims**



1. A relational algebra operator for sorting and merging successively supplied first and second sets of data elements each having key and satellite attributes, the number of data elements of said first set being smaller than that of said second set, comprising:

a sort processor having sort processing elements serially connected in a plurality of stages numbered 1, 2, . . . n, each stage having an input and an output, first and second buffer memories, a third memory having a first-in/first-out (FIFO) function, said first to third memories being connected to receive data elements from said input, and sort processing means connected to said first to third memories for sorting said data elements read out of said memories;

in the k-th stage sort processing means, where k equals any number from 1 to n, said first to third memories being arranged to successively receive from said input groups of data each group consisting of 2^{k-1} data elements, in a predetermined sequence of said first, third, second, third, first, . . . memories, and said sort processing means being arranged to successively carry out comparisons between groups of data read out of said first and third memories and between groups of data read out of said second and third memories with respect to the key attribute and to successively transfer to said output groups of data each consisting of 2^k data elements which have been sorted with respect to the key attribute; and

a merge processor including first and second merge processing elements, connected in parallel, each of said merge processing elements having a fourth buffer memory, a fifth memory having a FIFO function, and merge processing means connected to said fourth and fifth memories for performing a join by merging relational algebra operation on sorted data elements read out of said fourth and fifth memories with respect to the key attribute;

in said first and second merge processing elements said fourth memories being arranged to simultaneously receive the first set of data elements which have been sorted by said sort processor, said fifth memories being arranged to alternately receive first and second subsets of data elements of said second set which have been sorted by said sort processor, and said first and second subsets each having the same number of data elements as said first set.

4,514,827

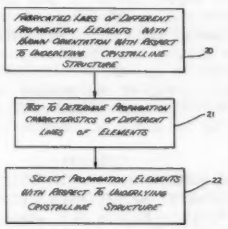
METHOD FOR SELECTING PROPAGATION ELEMENTS FOR MAGNETIC BUBBLE MEMORY

Hudson A. Washburn, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Apr. 11, 1983, Ser. No. 483,914

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—1 **9 Claims**


FABRICATED LINES OF DIFFERENT PROPAGATION ELEMENTS WITH KNOWN ORIENTATION WITH RESPECT TO UNDERLYING CRYSTALLINE STRUCTURE
20
TEST TO DETERMINE PROPAGATION CHARACTERISTICS OF DIFFERENT LINES OF ELEMENTS
21
SELECT PROPAGATION ELEMENTS WITH RESPECT TO UNDERLYING CRYSTALLINE STRUCTURE
22

1. In a magnetic bubble memory which includes a layer in which magnetic bubbles are propagated and permalloy propagation elements for propagating said bubbles, a method for selecting propagation elements comprising the steps of:

fabricating parallel lines of at least two different propagation elements;

propagating magnetic bubbles in said layer for each of said lines of different elements to determine the propagation characteristics of each of said lines of different elements;

selecting one of said lines of one of said elements for propagating bubbles in a first direction and one of said lines of the other of said elements for propagating bubbles in a second direction, based on said propagation characteristics so as to optimize bubble propagation in said layer;

whereby bubble propagation in said layer is optimized.

4,514,828

MAGNETIC BUBBLE MEMORY SENSE AMPLIFIER HAVING A PULSED CURRENT MODE OF OPERATION

Thomas A. Closson, Dallas; David B. Oxford, Garland; Stephen R. Schenck, McKinney, and Jerold A. Seitchik, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 90,960, Nov. 5, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,578

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **3 Claims**

1. A magnetic bubble system comprising:

a magnetic bubble device having a plurality of movable magnetic bubbles stored therein, and including a dummy resistor and a detector resistor which alters resistance in response to movement of a magnetic bubble therebeneath;

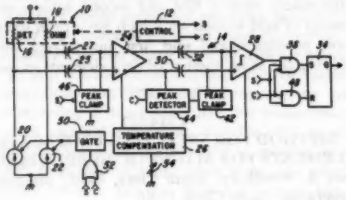
control circuitry connected to said device for periodically removing magnetic bubbles beneath said detector resistor,

wherein said control circuitry produces a first control signal when said bubbles are moved;

a first current source connected to said dummy resistor for supplying current therethrough;

a second current source connected to said detector resistor for supplying current therethrough;

a gate coupled to said first and second current sources and to said control circuitry, wherein said gate is responsive to



said control signal and causes said first and second current sources to supply current to said dummy and second resistors respectively only when said magnetic bubbles are moving beneath said detector resistor; and

comparison circuitry in electrical communication with said dummy resistor and said detector resistor to determine when the resistance of said detector resistor alters in response to the movement of said bubbles.

4,514,829

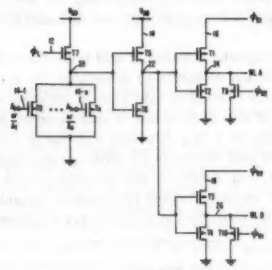
WORD LINE DECODER AND DRIVER CIRCUITS FOR HIGH DENSITY SEMICONDUCTOR MEMORY

Hu H. Chao, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,777

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 **10 Claims**



1. A narrow pitch CMOS word line decoder and driver circuit configuration for a semiconductor memory device comprising:

a system clock circuit for generating clock pulses;

a system voltage supply;

a decoder circuit including at least one p-type transistor having a source electrode connected to said voltage supply, a gate electrode connected to gating signals and a drain electrode connected to a first node, and a plurality of n-type address switch transistors, each having a drain electrode connected to said first node, a source electrode connected to ground voltage and a gate electrode connected to a separate one of a plurality of input address signals;

an inverter circuit including a pair of transistors, a first one of said pair of transistors having a source electrode connected to said voltage supply, a second one of said pair of transistors having a source electrode connected to ground voltage, said first and second inverter transistors having gate electrodes connected in common to said first node and drain electrodes connected in common to a second node; and

means connecting said second node to word lines of said semiconductor memory device.

4,514,830

DEFECT-REMEDIABLE SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY AND SPARE SUBSTITUTION METHOD IN THE SAME

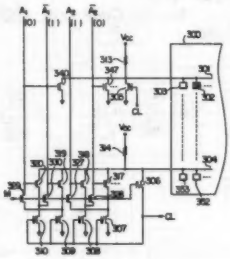
Takaaki Hagiwara, Kodaira; Masatada Horiuchi, Koganei; Ryuji Kondo, Kodaira; Yuji Yatsuda, Kanagawa, and Shinichi Minami, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 344,974

Claims priority, application Japan, Feb. 6, 1981, 56-15742

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—200 **15 Claims**



1. A semiconductor integrated circuit memory comprising a memory array having a plurality of usual memory cells arranged in a matrix form of columns and rows, usual column (or row) select lines for selecting the columns (or rows) of said memory array, address line means for inputting an address signal, and a usual address transistor circuit connected between said address line means and each of said usual column (or row) select lines for accessing a selected one of said usual column (or row) select lines in accordance with said address signal, wherein said memory further comprises:

a plurality of spare memory cells provided in the form of at least one column (or row) in said memory array;

a spare column (or row) select line for selecting the column (or row) of said spare memory cells;

a spare address transistor circuit connected between said spare column (or row) select line and said address line means;

a first converting circuit connected to said spare address transistor circuit and including first nonvolatile semiconductor memory element means, said first converting circuit being operable upon the written or erased state of said first nonvolatile memory element means for conditioning said spare address transistor circuit into an active state to allow access to said spare column (or row) select line; and

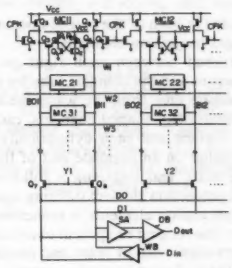
a second converting circuit connected to said spare column (or row) select line and including second nonvolatile semiconductor memory element means, said second converting circuit being operable upon the written or erased state of said second nonvolatile memory element means for setting said spare column (or row) select line to the grounded state.

4,514,831

STATIC-TYPE SEMICONDUCTOR MEMORY DEVICE

Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 393,119
Claims priority, application Japan, Jun. 30, 1981, 56-100526
Int. Cl.³ G11C 11/40
U.S. Cl. 365—203 9 Claims



1. A static-type semiconductor memory device operatively connected to receive an input address signal comprising:

a plurality of word lines;

a plurality of bit line pairs intersecting said plurality of word lines;

a plurality of static-type memory cells, respectively, operatively connected at intersections of said plurality of word lines and said plurality of bit line pairs, each of said bit line pairs respectively developing high and low potential levels corresponding to readout data from said static-type memory cells; and

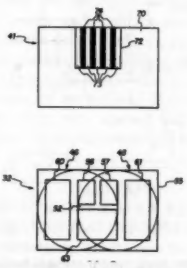
circuit means, operatively connected to said bit line pairs, for discharging the electric charges of said bit line pairs for a predetermined time period, said circuit means comprising means for lowering the potential levels of said bit line pairs to a level lower than said low potential level in response to a change in the input address signal.

4,514,832

SINGLE MIRROR RING LASER GYRO READOUT WITHOUT COMBINING OPTICS

Frederick Vescial, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 23, 1982, Ser. No. 421,762
Int. Cl.³ G01C 19/64
U.S. Cl. 356—350 12 Claims



1. A detector structure for use in a ring laser gyroscope of the type having counter rotating light beams having a frequency difference indicating the rate and sense of rotation of the gyroscope about an axis of rotational sensitivity, comprising:

a partially reflective surface for passing a portion of each of the beams therethrough and reflecting a portion of each of the counter rotating beams into a light path of the laser gyroscope,

a detector element spaced with respect to said partially reflective surface to receive the portions of the beams passing the partially reflective surface with patterns formed by the respective beams only partially overlapping,

first detector means on said detector element disposed to receive at least a non-overlapping portion of each of the beam patterns, thereby providing an intensity indication of the respective beams,

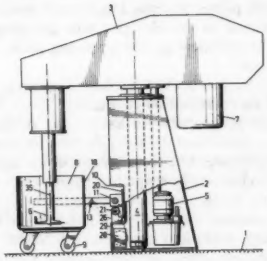
and second detector means on said detector element having at least two side-by-side detectors and a mask, each detector being disposed to receive at least an overlapping portion of the beams, said beams passing through said mask for detecting the motion of interference fringes produced by the respective beams and for providing an indication of at least a frequency difference between said beams.

4,514,833

DISPERSING MACHINE WITH CONTAINER HOLDING DEVICE

Herbert Dürr, Viernheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,488
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138382
Int. Cl.³ B01F 7/16
U.S. Cl. 366—207 3 Claims



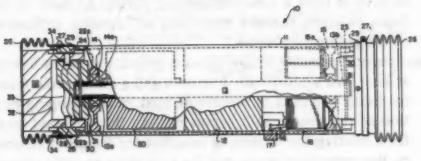
1. A dispersing machine having a machine upright and a cantilevered machine head mounted on said upright for raising and lowering movement by means of a lifting apparatus acted upon by a pressure medium pumping assembly, a rotatably drivable stirring apparatus having a portion mounted in one cantilevered end of said machine head, said stirring apparatus being drivable by means of a drive motor mounted on the dispersing machine and being movable vertically downwardly into a container disposed beside the machine upright, a container holding device mounted on said upright for releasably connecting said container to said upright, said container holding device having at least two clamping members substantially receiving the container therebetween concentrically with said strirring apparatus during processing of material contained therein, at least one of said clamping members being provided with a spindle nut disposed on a rotatably drivable spindle, said spindle being disposed horizontally and coupling said clamping members with a rotatable motor driven by a pressure medium, and means, fluidly connecting said rotatable motor to said pressure medium pumping assembly, for rotatably driving said rotatable motor, and thus rotatably driving said spindle, to cause movement of said at least one clamping member relative to the other of said clamping members.

4,514,834

EXPENDABLE UNDERWATER ACOUSTIC PROJECTOR

Paul A. Hanson, Spring Valley, and James M. Walton, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 16, 1983, Ser. No. 504,907
Int. Cl.[3] H04R 17/00
U.S. Cl. 367—141 2 Claims



1. An apparatus for projecting acoustic energy through a water medium comprising:

an elongate tube disposed in the water medium for providing a protective enclosure having a pair of openings;

an electric motor secured to the inside of the elongate tube and having a shaft bidirectionally extending therefrom coaxially with the elongate tube for imparting rotary motion;

means mounted on the shaft for providing an inertial mass to improve the projection of acoustic energy;

means circumferentially connected with the inside of the elongate tube on opposite sides of the electric motor for journaling the bidirectionally extending shaft therein;

means contained within the elongate tube for supplying electrical power to drive the electric motor;

means carried on the elongate tube for magnetically coupling the electrical power supplying means to the electrical motor;

means disposed in both of the pair of openings for defining a pair of rigid projection elements;

means interposed between each rigid projection element defining means and the elongate tube for sealing the inside of the elongate tube from the water medium; and

a pair of cylindrically-shaped elements, each shaped with a camming surface and each cylindrically-shaped element being mounted on an opposite end of the bidirectionally extending shaft, and engaging a follower connected to each rigid projection element defining means for camming the rigid projection elements in coincident diverging and coincident converging reciprocal excursions, the elongate tube is provided with at least one projection near each opening that is shaped to engage correspondingly-shaped axially oriented disposed slots in each rigid projection element defining means to prevent them from being rotated, each camming surface of each cylindrically-shaped element of the camming means is an endless groove having a pattern repeated every 180 degrees on the circumference of eacy cylindrically-shaped element and the follower is two spur-shaped follower projections provided and positioned to engage the groove at diametrically opposed locations on each cylindrically-shaped element;

means carried within the elongate tube and communicating with the water medium for pressure compensating the interior of the acoustic projector; and

means provided in the elongate tube for venting excess pressure from the interior of the acoustic projector.

2. An apparatus for projecting acoustic energy through a water medium comprising:

an elongate tube disposed in the water medium for providing a protective enclosure having a pair of openings;

an electric motor secured to the inside of the elongate tube and having a shaft bidirectionally extending therefrom coaxxially with the elongate tube for imparting rotary motion;

means mounted on the shaft for providing an inertial mass to improve the projection of acoustic energy;

means circumferentially connected with the inside of the elongate tube on opposite sides of the electric motor for journaling the bidirectionally extending shaft therein;

means contained within the elongate tube for supplying electrical power to drive the electric motor;

means carried on the elongate tube for magnetically coupling the electrical power supplying means to the electrical motor;

means disposed in both of the pair of openings for defining a pair of rigid projection elements;

means interposed between each rigid projection element defining means and the elongate tube for sealing the inside of the elongate tube from the water medium; and

a pair of cylindrically-shaped elements, each shaped with a camming surface and each cylindrically-shaped element being mounted on an opposite end of the bidirectionally extending shaft, and engaging a follower connected to each rigid projection element defining means for camming the rigid projection elements in coincident diverging and coincident converging reciprocal excursions, the elongate tube is provided with at least one projection near each opening that is shaped to engage correspondingly-shaped axially oriented disposed slots in each rigid projection element defining means to prevent them from being rotated, each camming surface of each cylindrically-shaped element of the camming means is a series of hills and valleys on an axially exposed end having a pattern repeated every 180 two follower portions held abutting on the hills and valleys by ambient water pressure at diametrically opposed locations on the axially exposed ends of each cylindrically-shaped element;

means carried within the elongate tube and communicating with the water medium for pressure compensating the interior of the acoustic projector; and

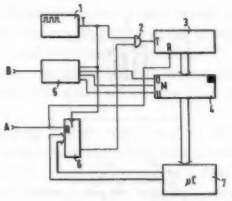
means provided in the elongate tube for venting excess pressure from the interior of the acoustic projector.

4,514,835

DEVICE FOR MEASURING TIME INTERVALS BETWEEN A PLURALITY OF SUCCESSIVE EVENTS

Andreas Böttigheimer, Neuffen; Karl-Heinz Einsele, Weilheim, and Klaus Henig, Tubingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 615,472
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328540
Int. Cl.[3] G04F 8/00, 10/00
U.S. Cl. 368—118 6 Claims



1. A device for measuring time intervals between a plurality of events, comprising a clock pulse generator; a pulse counter having a clock input and an output; a gating member connected between said clock pulse generator and the clock pulse input of the counter; a multistage storing device having a data input connected to the output of said counter, a readout input, and an output; a first control circuit for setting an adjustable gating time for said gating member, said first control circuit

having an input connectable to a source of a first or start event signal and an output connected to said gating member to start in response to a first event signal a measuring time cycle of a predetermined length; and a second control circuit having an input connectable to a source of subsequent event signals and an output connected to the readout input of said storing device; and said storing device retrieving in response to the output signals from said second control circuit corresponding to the occurrences of the subsequent event signals, momentary counts from said counter and storing said counts for further processing.

4,514,836

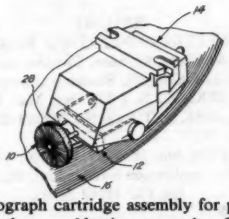
BRUSH CONTACT FOR PHONOGRAPH TONE ARM DYNAMIC STABILIZER

James Kogen, Evanston, and C. Roger Anderson, Wilmette, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Filed Jan. 31, 1983, Ser. No. 462,671

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—74 **6 Claims**



1. A phonograph cartridge assembly for playing a phonograph record, the record having a record surface with a record trace, the assembly comprising:

a phonograph cartridge;

a phonograph stylus carried on the phonograph cartridge, the stylus having a longitudinal extent which, while the stylus is on the record, is parallel to a tangent to the record trace, the stylus thereby defining a longitudinal direction in the direction of the longitudinal extent;

a phonograph tone arm dynamic stabilizer mounted on the phonograph cartridge; and

a brush contact for the phonograph tone arm dynamic stabilizer mounted on the stabilizer and including a bristle base, bristles mounted on the base and having free ends fanned in an arc about the base, the arc defining a plane of the arc, and means for mounting the bristle base to the stabilizer (a) for positioning the plane of the arc substantially transverse to the longitiudinal direction of the stylus, with the cartridge, stylus, stabilizer and brush contact being constructed, sized and arranged such that a portion of the bristle free ends may contact the phonograph record surface while the stylus tracks the record trace, and (b) for providing pivoting of the base and the bristles in the plane of the arc in response to some forces applied to the assembly in the plane of the arc such that another portion of the bristle free ends may contact the phonograph record surface while the stylus tracks the record trace.

4,514,837

APPARATUS FOR OPTICALLY READING AND/OR RECORDING INFORMATION

Gerard E. Van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,342

Claims priority, application Netherlands, Oct. 19, 1982, 8204023

Int. Cl.³ G11B *21/08, 7/00, 5/56*

U.S. Cl. 369—219 **3 Claims**

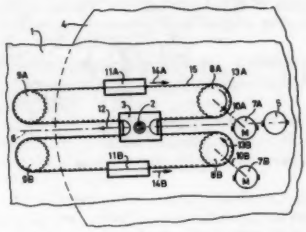
1. An apparatus for optically reading and/or recording information on a rotary optical disc, which apparatus comprises:

a frame,

an objective,

an objective carrier on which the objective is arranged and which is movable over the frame along a radial path relative to the disc, and

a drive unit for driving the objective carrier along said radial path, which unit comprises an electric motor and transmission means between the electric motor and the objective carrier, characterized in that the drive unit further comprises:



two identical electric motors which rotate in opposite directions,

two identical balancing masses which are each arranged on one side of the objective carrier and which move along paths parallel to the path of the objective carrier but in an opposite direction, and in that the two electric motors, the objective carrier and the balancing masses are coupled to each other by the transmission means for synchronizing said movements.

4,514,838

ARRANGEMENT FOR ADJUSTMENT OF THE VERTICAL TRACKING FORCE ON A PHONOGRAPH STYLUS

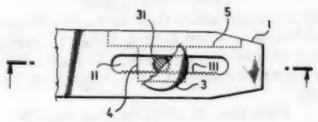
Jiri Janda, and Karel Hrdlicka, both of Prague, Czechoslovakia, assignors to Tesla, koncernovy podnik, Prague, Czechoslovakia

Filed Oct. 29, 1982, Ser. No. 437,621

Claims priority, application Czechoslovakia, Apr. 21, 1982, 2384-82

Int. Cl.³ G11B *21/16*

U.S. Cl. 369—254 **3 Claims**

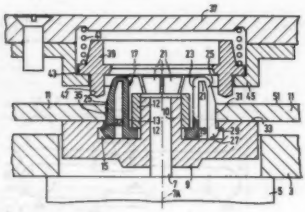


1. An arrangement for the adjustment of the vertical tracking force on a stylus mounted in a phonograph stylus holder disposed on the outer end of a forward longer end portion of a phonograph tone arm, said tone arm being mounted upon and supported by a bearing, the tone arm having a shorter part thereof extending rearwardly from the bearing, said shorter rear part of the tone arm being provided with a slot having a rack gear on one side of the slot and with a rotatable adjustment element with a pinion meshing with said rack gear, a counterweight system situated below the tone arm and connected to said rotatable adjustment element so as to be moved selectively in opposite directions lengthwise of the rear portion of the tone arm, and means for the longitudinal guiding of the counterweight system along the rear part of the tone arm.

4,514,839
DISC PLAYER FOR A RIGID INFORMATION-CARRYING DISC

Kurt Eisemann, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,305
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211359; Mar. 27, 1982, 3211360
Int. Cl.[3] G11B 5/16, 25/04
U.S. Cl. 369—270 5 Claims



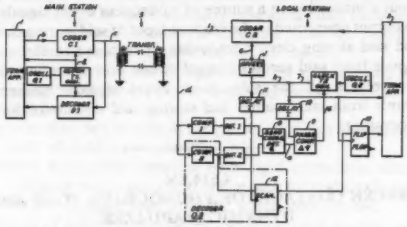
1. A disc player for a rigid information-carrying disc, which player comprises a disc holder on which the information-carrying disc rotates during information transfer, which disc holder comprises a turntable and a centering device, which device comprises a plurality of centering elements which are arranged along a circle and which are each resilient in a radial direction so that the centering elements, which act on the wall of the center hole in the disc, keep the disc centered during its rotation, which player further comprises a lid which is movable between an open and a closed position and which carries a disc loader, the disc being resiliently urged onto the centering device and the turntable by means of a disc loader when the lid is moved to the closed position, characterized in that the lid is movable from the open position to the closed position in two stages, the lid being coupled to lifting means which after a first stage of the closing movement of the lid, in which the disc loader resiliently urges the disc onto the centering device and the turntable, lifts the lid in a second stage until the disc loader is again clear of the information-carrying disc which is clamped onto the centering device, the disc being kept in a centered position on the turntable by a radially outward resilient deflection of the resilient centering elements, said centering elements being constructed as U-shaped members, whose inner limbs are connected to each other and whose outer limbs deflect resiliently outwards.

4,514,840
DATA TRANSMISSION SYSTEMS FOR FULL DUPLEX COMMUNICATION

Edgar Bader, Rueckersdorf; Gerd Rohrbach; Jürgen Petersen, both of Nuremberg, and Ludwig Kittel, Heroldsberg, all of Fed. Rep. of Germany, assignors to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,478
Int. Cl.[3] H04J 3/06
U.S. Cl. 370—29 3 Claims

1. A data transmission system for a full duplex communication via a two wire link between a main station and a local station, the main station generating a main clock signal whereby during one half period of the main clock signal a coded data signal is transmitted from the main station to the local one and during the other half period the coded data signal is transmitted from the local station to the main station, said local station comprising a separate local clock pulse generator switchable between a mode of operation in which it generates a first local clock signal having a period corresponding to that of the main clock signal, and another mode of operation in which it generates a second local clock signal the period of which differs from that of the main signal by a fixed amount; means for comparing the phase of the received coded data signal with one of the local clock signals and for switching

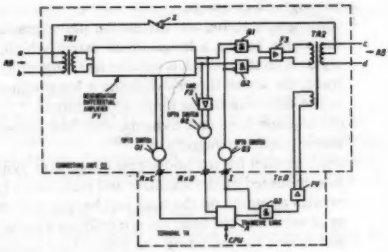


over the operational modes of the local clock pulse generator when the received coded data signal is out of phase with the one local clock signal.

4,514,841
CONNECTING UNIT FOR A RING BUS

Sverre G. Sem-Sandberg, Handen, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00229, § 371 Date Mar. 2, 1983, § 102(e) Date Mar. 2, 1983, PCT Pub. No. WO83/00238, PCT Pub. Date Jan. 20, 1983
PCT Filed Jun. 28, 1982, Ser. No. 474,632
Claims priority, application Sweden, Jul. 10, 1981, 8104322
Int. Cl.[3] H04J 3/08
U.S. Cl. 370—55 2 Claims



1. A telecommunication system comprising a plurality of terminals for accepting or transmitting information;

a plurality of connecting units;

bus means interconnecting the connecting units to form a ring bus so that information flows in a loop;

a plurality of terminals capable of receiving and transmitting information; each of said terminals including emitting means for emitting activity signals to indicate when the terminal is energized and desires access to the information flow of the loop;

means for connecting each terminal to an associated connecting unit whereby information can flow from the connecting unit to the terminal and from the terminal to the connecting unit, said connecting means also connecting the emitting means to the connecting unit to feed the activity signals when present to the connecting means; and

said connecting means having an input means for receiving information from said bus means, output means for transmitting information to said bus means, controlled gating means connecting said input means to said outputs for permitting the transfer of information directly from said

input means to said output means in the absence of the activity signals and

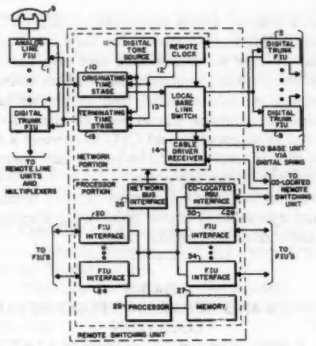
further gating means reponsive to the activity signals for connecting said input means to the associated terminal and said associated terminal to said output means when the activity signals are present whereby information flows from said input means via said associated terminal to said output means instead of directly from said input means to said output means.

4,514,842

T-S-T-S-T DIGITAL SWITCHING NETWORK

Robert E. Renner, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Nov. 3, 1983, Ser. No. 548,484
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—63 **25 Claims**



1. In a telecommunications switching system, a T-S-T-S-T digital switching network for connecting subscribers comprising:

at least two digital switching offices including a base switching unit and a remote switching unit;

digital span means connected to said base switching unit and to said remote switching unit and being operated to transmit PCM data samples between said digital switching offices;

said remote switching unit including:

a clock for generating a plurality of periodic pulses;

a plurality of interface equipment connected to said digital span means and to said subscribers of said remote switching unit;

first and second PCM buses connected to said subscribers via said interface equipment for transmitting a plurality of PCM data samples;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM samples from said interface equipment, said first and second originating time switching means being connected to said interface equipment via said first and second buses respectively;

first and second space switching means, each including:

first latching means connected to said corresponding first and second originating time switching means and to said clock, said first latching means being operated in response to said subsequently transmitted PCM samples to store said PCM sample during each time slot;

second latching means connected between said first latching means and one of said plurality of interface equipment and connected to said clock, said second latching means being operated in response to a first periodic pulse for all even time slots to store said PCM samples of said first latching means for transmission to said one of said plurality of said interface equipment; and

third latching means connected between said first latching means and a second of said plurality of interface equipment and connected to said clock, said third latching means being operated in response to a second periodic pulse for all odd time slots to store said PCM samples of said first latching means for transmission to said second of said plurality of interface equipment; and

said base switching unit including:

digital control means connected to said digital span means and operated to receive said transmitted PCM samples of said interface equipment of said remote switching unit;

analog control means connected between a plurality of said subscribers of said base switching unit and said base switching unit;

first and second space switching means; first and second PCM buses for transmitting a plurality of PCM data samples, said PCM buses connected to said analog and to digital control means;

first and second originating time switching means, each of said originating time switching means being operated to switch said PCM data samples from said digital control means, said first and second originating time switching means being connected respectively between said first and second space switching means and said digital control means via said first and second buses; and

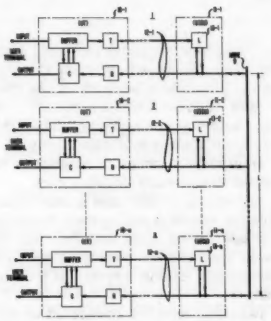
first and second terminating time switching means being connected respectively between said first and said second space switching means and said analog control means, said first and second terminating time switching means respectively operated to switch said PCM data samples from said first and second space switching means through said analog control means for transmission to one said subscriber of said base switching unit from one said subscriber of said remote switching unit.

4,514,843

PACKET SWITCHED COMMUNICATION SYSTEM COMPRISING COLLISION AVOIDANCE MEANS

Andres Albanese, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1982, Ser. No. 446,191
Int. Cl.³ H04J *6/00*; H04Q *11/04*
U.S. Cl. 370—93 **10 Claims**



1. Digital transmission system for controlled transmission of signal packets among a plurality of users, the system comprising a plurality of user links that terminate at a first node, at least one of these user links comprising

(a) a user station comprising signal packet transmitting means;

(b) transmission line means connecting the transmitting

means to a first signal-sensing means having at least a "busy" and an "idle" state, the first signal-sensing means being in the busy state whenever a signal packet is arriving at the first signal-sensing means from the transmitting means, and in the idle state otherwise;

(c) second signal-sensing means, connected to the first node, the second signal-sensing means having at least a "busy" and an "idle" state, being in the busy state if the first node carries a signal packet, and in the idle state otherwise;

(d) third means, responsive to the first signal-sensing means and to the second signal-sensing means, for connecting the transmitting means to the first node if the second signal-sensing means are in the idle state when the state of the first signal-sensing means changes from the idle to the busy state upon arrival of a signal packet at the first signal-sensing means from the transmitting means; and

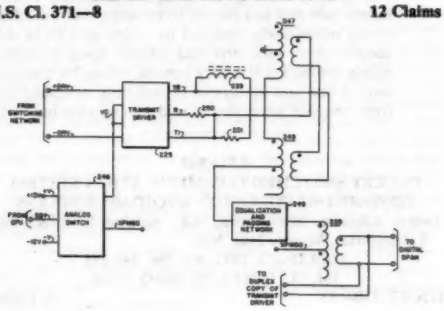
(e) the transmitting means are adapted for transmitting a signal packet to the first signal-sensing means independent of the state of the second signal-sensing means, and for later retransmitting the same signal packet to the first signal-sensing means if the second signal-sensing means were in the busy state when the first signal-sensing means were in the busy state at the time of arrival of the transmitted signal packet at the first signal-sensing means.

4,514,844

DUPLEX DIGITAL SPAN TRANSMISSION CIRCUIT ARRANGEMENT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,561
Int. Cl.³ G06F *11/20*; H04B *3/46*
U.S. Cl. 371—8 **12 Claims**



1. In a telecommunications switching system having a CPU, a transmission circuit arrangement is connected to a digital span and to a switching network of said switching for providing a fault tolerant arrangement for converting unipolar switching network data to bipolar digital span data, said transmission circuit arrangement comprising:

said transmission circuit arrangement including first and second transmission circuit copies;

first and second transformer means connected respectively between said first and second transmission circuit copies and said digital span, said first and second transformer means respectively connected to said first and second transmission circuit copies via first and second output lead;

said switching network connected to said first and second transmission circuit copies via corresponding first and second input leads and being operated to alternately transmit first and second input signals of a first value;

each said transmission circuit copy comprising:

first current control means connected to said first input lead and to said first and second output leads, said first current control means being operated to connect said first input lead to said second output lead and being further operated to permit a predetermined current to flow from said first to said second output lead via said corresponding transformer means;

second current control means connected to said second input lead and to said first and second output leads, said second current control means being operated to connect said second input lead to said first output lead and being further operated to permit a predetermined current to flow from said second to said first output lead via said corresponding transformer means;

voltage control means connected to said CPU, to a voltage source and to said first and second current control means, said voltage control means being operated in response to said CPU to enable said first transmission circuit copy and simultaneously to disable said second transmission circuit copy or alternatively being operated in response to said CPU to disable said first transmission circuit copy and simultaneously to enable said second transmission circuit copy;

impedance control means connected to said CPU, to said corresponding transformer means via a terminal lead and to said voltage control means, said impedance control means operated in response to said CPU to connect a high impedance on said terminal lead to disable said corresponding transmission circuit copy or alternatively being operated in response to said CPU to connect a low impedance to said terminal lead to enable said corresponding transmission circuit copy; and

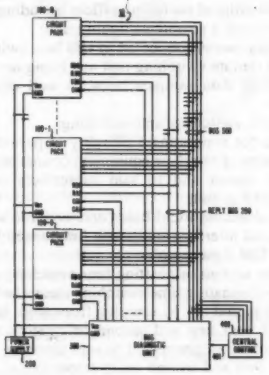
said first and said second current control means of said enabled transmission circuit copy being alternately operated to produce said bipolar data.

4,514,845

METHOD AND APPARATUS FOR BUS FAULT LOCATION

Thomas J. J. Starr, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 23, 1982, Ser. No. 410,269
Int. Cl.³ G06F *11/26, 11/22*
U.S. Cl. 371—15 **15 Claims**



6. A bus fault location arrangement comprising

a bus,

a plurality of devices each having a terminal connected to said bus, first and second power applying terminals and an impedance control terminal,

means for interconnecting the first power applying terminals of said plurality of devices,

means for interconnecting the second power applying terminals of said plurality of devices,

energizing means for energizing said plurality of devices,

means responsive to a fault condition on said bus for generating a fault signal,

means responsive to said fault signal for transmitting a signal to the impedance control terminal of each of said plurality of devices to place each of said plurality of devices in a high impedance state,

means responsive to said fault signal for alternatively transmitting first and second signal levels on said bus,

first current sensing means for sensing current flow between said energizing means and said interconnected first power applying terminals of said plurality of devices,

first error signal generating means for generating a first error signal when the current flow sensed by said first current sensing means exceeds a first predetermined magnitude,

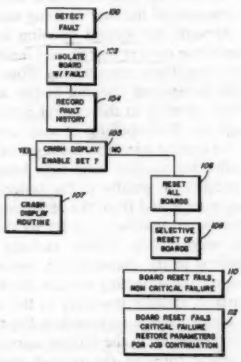
second current sensing means for sensing current flow between said energizing means and said interconnected second power applying terminals of said plurality of devices and

second error signal generating means for generating a second error signal when the current flow sensed by said second current sensing means exceeds a second predetermined magnitude, wherein said first and second predetermined magnitudes may be equal.

4,514,846
CONTROL FAULT DETECTION FOR MACHINE RECOVERY AND DIAGNOSTICS PRIOR TO MALFUNCTION

Anthony M. Federico, West Webster; Ernest L. Legg, Fairport, and Tuan A. Nguyen, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 421,011
Int. Cl.³ G06F *11/00*; G01R *31/28*
U.S. Cl. 371—16 **15 Claims**



1. In an electronic control having a plurality of control elements for controlling a printing machine having a plurality of operating components including a photoreceptor cooperating with one another to produce images on support material, the electronic control including a hardware portion, a software portion, and suitable memory, the control being subject to software faults, said faults capable of causing machine misoperation, said control element connected to the operating components, a method of software fault detection prior to machine misoperation comprising the steps of:

categorizing the conditions that cause software faults,

storing said conditions in memory,

monitoring the conditions that result in software faults,

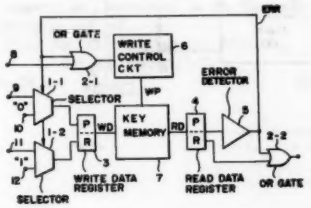
recognizing the occurrence of one of the conditions, and

relating said one of the conditions to one of the operating components.

4,514,847
KEY STORAGE ERROR PROCESSING SYSTEM

Terutaka Tateishi, Kawasaki, and Kazuyuki Shimizu, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1982, Ser. No. 419,927
Claims priority, application Japan, Sep. 24, 1981, 56-151046
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **4 Claims**



1. A key storage error processing system for a system which is provided with a key storage having stored therein main storage keys respectively corresponding to pages into which a main storage is split, each main storage key having at least a reference bit indicating whether the corresponding page is being accessed and a change bit indicating whether information has been written into the page, and in which a parity bit is added to each of the reference bit and the change bit to form the main storage key, said system comprising:

detecting means, operatively connected to the key storage, for detecting a parity error in a pair of the reference bit and the parity bit and a pair of the change bit and the parity bit when the main storage key is read out; and

means, operatively connected to the key storage and said detecting means, for rewriting the main storage key after setting the reference bit to a state indicating access to the corresponding page and adding a new parity bit to the reference bit when a parity error is detected by the detecting means in the pair of the reference bit and the parity bit and after setting the change bit to a state indicating the write in the corresponding page and adding a new parity bit to the change bit when a parity error is detected in the pair of the change bit and the parity bit.

4,514,848
METHOD AND APPARATUS FOR THE PRODUCTION OF PRE-PULSE-FREE, SMOOTH LASER RADIATION PULSES OF VARIABLE PULSE DURATION

Klaus J. Witte, Munich; Ernst Fill, Garching, and Walter Scrlac, Maintal, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

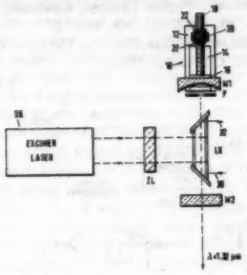
Filed Mar. 17, 1982, Ser. No. 359,078
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111805
Int. Cl.³ H01S *3/091*
U.S. Cl. 372—25 **2 Claims**

1. A method of producing pre-pulse-free, smooth laser radiation pulses having substantially no temporal sub-structure, whose duration is adjustable between about 400 picoseconds and about 20 nanoseconds, by means of a laser which includes an optical resonator, a stimulatable laser medium arranged in the resonator having an upper and lower level forming a laser transition, and an excitation source for populating the upper level of the laser medium comprising:

(a) adjusting the temperature and pressure conditions of the laser medium so that the condition $\Delta\nu = c/2L$ is fulfilled, in which $\Delta\nu$ represents half the maximum width of the laser transition, c means the velocity of light and L the length of the optical resonator; and

(b) stimulating the laser medium so that the duration of

excitation is shorter than the build up time of the stimulated laser radiation pulse emitted by the exciteed laser medium, the life-time of the upper laser level is greater



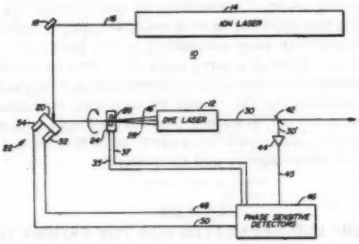
than the duration of about 30 round trips of the radiation in the optical resonator, and so that the life-time of the upper level as a consequence of spontaneous emission is greater than 100 nanoseconds.

4,514,849

DYE LASER WITH ROTATING WEDGE ALIGNMENT SERVO

Kenneth G. Witte, Mountain View, and Thomas F. Johnston, Jr., Sunnyvale, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Sep. 7, 1983, Ser. No. 529,979
Int. Cl.³ H01S 3/13
U.S. Cl. 372—29 **11 Claims**



1. A laser system including an optically pumped laser, a pumping laser for optically exciting the optically pumped laser, and optical means for coupling the output beam from the pump laser with the optically pumped laser and wherein the improvement comprises: means for maintaining relative alignment between the output beam of the pump laser and the optically pumped laser to maximize the output power thereof comprising:

means for positioning the pump laser beam relative to said optically pumped laser cavity;

means for rotating the pump laser beam such that the beam defines the surface of a cone;

means for sensing the output power of the optically pumped laser;

means for resolving modulations in the output power of the optically pumped laser attributable to the orthogonal components of said pump laser beam for determining the misalignment of the two orthogonal components of the pump laser beam, in response to said output power sensing means; and

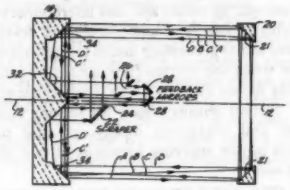
means for activating said pump laser beam positioning means to maximize the optically pumped laser output, in response to said modulations resolving means.

4,514,850

COMMON-PASS DECENTERED ANNULAR RING RESONATOR

Dale A. Holmes, Simi Valley, and Thomas R. Waite, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1983, Ser. No. 494,848
Int. Cl.³ H01S 3/08
U.S. Cl. 372—95 **15 Claims**



1. An optical resonator, for use in a laser having an annular gain region comprising:

a first ring mirror having an annular interior conical reflecting surface, a second ring mirror having an annular interior substantially conical reflecting surface spaced from and facing the reflecting surface of said first ring mirror, the cones which would be formed by extension of the conical surfaces of each ring mirror to an apex being coaxial, a central mirror having an exterior substantially conical reflecting surface coaxial with the conical surfaces of the first and second mirrors, said central mirror located radially inward and on the axis of said first ring mirror, a scraper mirror having a reflecting surface positioned along the axis of the central mirror at an angle to and opposite the central mirror, the scraper mirror having a first opening aligned with said axis and a second opening positioned to one side of the first opening such that light rays passing through the second opening intercept the conical surface of the central mirror, and feedback mirror means for reflecting light rays passing from the central mirror through the second opening in the scraper back through the first opening to the central mirror, the rays passing through the first opening of said scraper mirror impinging on the central mirror in the regin of the apex of the conical reflecting surface, said rays being reflected substantially radially outwardly to the reflecting surface of the first ring mirror and from the reflecting surface of the first mirror in an annular cylinder to the reflecting surface of the second ring mirror, radially across the second ring mirror to the diametrically opposite side of the second ring mirror reflecting surface, back to the first ring mirror surface, radially inwardly to the central mirror, and in an annular space surrounding the rays passing through said first opening to the scraper mirror, a portion of the rays passing through the second opening being reflected by the feedback mirror means through the first opening to form a closed path for some of the light energy.

4,514,851

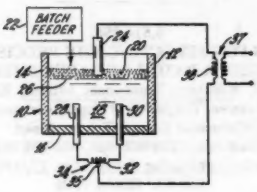
ARC CIRCUIT ELECTRODES FOR ARC GLASS-MELTING FURNACE

Charles S. Dunn, Pataskala, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,852
Int. Cl.³ C03B 5/02
U.S. Cl. 373—27 **6 Claims**

1. An arc glass-melting furnace comprising: a chamber adapted for holding a body of molten glass, said chamber having means for supplying batch thereto and means for withdrawing molten glass therefrom; an arc electrode positioned in said chamber above the upper surface of said body of molten glass for establishing an arc between said arc electrode and said

glass; a plurality of electrodes positioned in the bottom of said chamber; and means for supplying electrical power to said arc electrode and said plurality of bottom electrodes, said power supply means having a first terminal connected to said arc



electrode and a second terminal connected to said plurality of bottom electrodes for establishing current flow in said glass between said arc electrode and said bottom electrodes which current is conducted within said arc electrode and said bottom electrodes.

4,514,852

PROCESS FOR PROTECTED TRANSMISSION OF DIGITAL SIGNALS

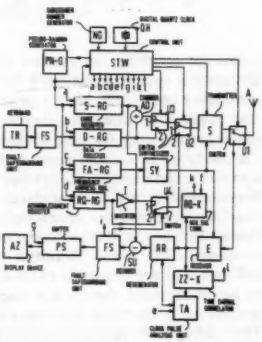
Manfred Hanni, Puchheim, and Josef Brusch, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,687

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136461

Int. Cl.³ H04L *27/30;* H04J *6/00*

U.S. Cl. 375—1 **6 Claims**



1. In a process for protecting transmission of digital signals via short waves between a transmitting station and a receiving station, in which the digital signals are encoded and transmitted as bursts, and in which, prior to transmission of a further burst, the receiving station returns an acknowledge signal to the transmitting station, the improvement therein comprising the steps of:

synchronizing the transmitting and receiving stations with highly accurate quartz crystal clocks by transmitting, at the beginning of the transmission process, at least one time signal which comprises an autocorrelation code sequence, receiving and analyzing the time signal with a time signal correlator, and adjusting the receiving station clock with the correlation result;

transmitting and receiving bursts in a pseudo-random frequency jump pattern of frequencies in a predetermined group of frequencies with each jump interval comprising the burst and acknowledgement signal transmission times;

recalculating the code sequence for each burst on the basis of the time of the transmitting station clock and the subscriber number of the receiving station; decoding each received signal burst and determining if the same is error-free or error-correctable; and applying only an error-free or error-correctable decoded burst to an output device.

4,514,853

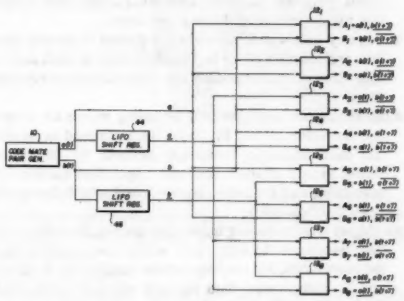
MULTIPLEXED NOISE CODE GENERATOR UTILIZING TRANSPOSED CODES

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 13, 1982, Ser. No. 449,029

Int. Cl.³ H03K *13/24*

U.S. Cl. 375—34 **14 Claims**



1. A method of generating a pair of expanded multi-bit digital noise coded signals from a pair of multi-bit digital noise coded signals comprising the steps of:

generating simultaneously first and second multi-bit digital noise coded signals;

generating the inverse of said second signal;

delaying the inverse of said second signal by a predetermined time delay and combining it with said first signal to form a first expanded multi-bit digital noise coded signal beginning with said first signal;

generating the inverse of said first signal;

generating the complement of the inverse of said first signal; and

delaying the inverse complement of said first signal and combining it with said second signal to form a second expanded multi-bit digital noise coded signal beginning with said second signal.

4,514,854

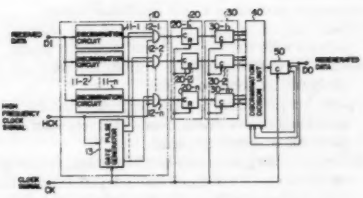
DISCRIMINATION CIRCUIT FOR RECEIVED DATA

Akira Ashida, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,402

Int. Cl.³ H04L *1/00*

U.S. Cl. 375—94 **6 Claims**



1. A discrimination circuit for received data comprising:

a multiple-instant discrimination unit including means for discriminating the amplitude of received data with respect to one or more specified discrimination levels, means for providing gate pulses defined by a pattern in the received data, means responsive to the amplitude discrimination result and the gate pulses for passing pulses of a high frequency clock signal for each of said discrimination levels, said high frequency clock signal having a frequency which is higher than that of a clock signal of said received data;

a counter unit including means for counting pulses fed from said passing means said multiple-instant discrimination unit and for sending out values of respective bits of said received data to store the output from said counting means as values representing each data bit to be discriminated, with the capability of storing a specified number of bits by successively shifting said bits;

a memory unit which receives the output from said counter unit and stores a bit to be discriminated as well as a specified number of succeeding bits while successively shifting them;

a discrimination decision unit including means for determining the value of said bit to be discriminated according to the discrimination condition defined by the contents stored in said counter unit and a specified number of bits preceding said bit to be discriminated which have already been discriminated;

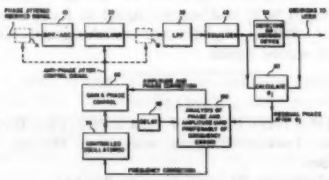
an output unit including means for storing the output of said discrimination decision unit while successively shifting the stored bits, for sending out the leading bit in the stored bits as regenerated data for said received data, and for feeding back all of stored bits to said discrimination decision unit as already discriminated results of a specified number of bits preceding said bit to be discriminated.

4,514,855

MEANS AND METHOD FOR REDUCTION OF PHASE JITTER

Gordon R. Lang, Bolton; Fred M. Longstaff, Islington, and Chi H. Lee, Willowdale, all of Canada, assignors to Ese Limited, Rexdale, Canada

Filed Aug. 2, 1983, Ser. No. 519,753
Claims priority, application Canada, Sep. 3, 1982, 410773
Int. Cl.³ H03D *3/22*; H04L *25/40*
U.S. Cl. 375—97 **8 Claims**



7. Means for reducing a component of phase jitter at a series of transmitted signals at a receiver in a communications channel comprising:

means for providing a first oscillator signal,

means for modifying the phase of the received signal in accord with the phase of said oscillator signal,

means for determining for a modified received signal the probable transmitted signal,

means for providing a signal representing the approximate phase angle between said modified received signal and the probable transmitted signal,

means providing a second oscillator signal corresponding to said first oscillator signal but delayed relative thereto by a delay substantially corresponding to the delay between said modification and said determination,

means providing a signal representative of the phase difference between said phase angle signal and said second oscillator signal,

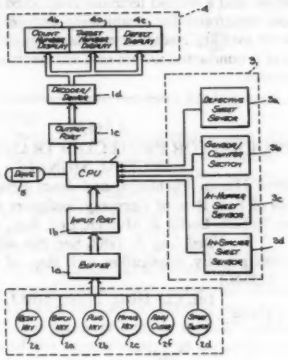
means for modifying said first and second oscillator signals in accord with said representative signal in a sense to reduce said phase angle signal.

4,514,856

APPARATUS FOR SELECTING THE PRECISE NUMBER WITHIN A BATCH OF PAPER SHEETS

Mamoru Asai, Kashiwa; Tsuneyoshi Mitani, Kawasaki, and Hiroyuki Ookawa, Tokyo, all of Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1983, Ser. No. 484,284
Claims priority, application Japan, Apr. 17, 1982, 57-64529
Int. Cl.³ G06M *7/06*
U.S. Cl. 377—8 **2 Claims**



1. An apparatus for counting the number of paper sheets wherein a target number entered by an entry unit is stored in a target number memory and displayed in a target number display section, the paper sheet count number supplied from a sensor and counter section since the time of start of the counting operation is displayed in a count number display section and compared to said target number, and wherein the counting operation is discontinued in case of coincidence between said count number and the target number, characterized in that said entry section has a batch key, a plus key and a minus key, said target number memory has stored therein a predetermined number of fixed data that are displayed cyclically during the time said batch key is operated, the cyclical display is discontinued upon termination of the batch key operation and one of said fixed data prevailing at the time of termination of the batch key operation is entered in said target number memory, the fixed data thus entered in said target number memory is incremented or decremented by one each time said plus or minus key is operated, the incremented or decremented data prevailing when the plus or minus key is entered as said target number, and the target number thus entered is compared to the count number from said sensor and counter section.

4,514,857

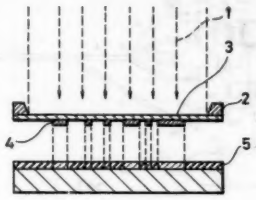
X-RAY LITHOGRAPHIC SYSTEM

Takashi Kimura, Higashimurayama; Kozo Mochiji, Hachioji, and Hidehito Obayashi, Nerima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,447
Claims priority, application Japan, Oct. 15, 1982, 57-179851
Int. Cl.³ G21K *5/00*
U.S. Cl. 378—034 **4 Claims**

1. In an X-ray lithographic system having means to cause a synchrotron radiation flux of desired diameter to be incident on a convex mirror, and means to irradiate a radiation sensitive

resist film with reflected light from the convex mirror, through a mask having a desired pattern; an X-ray lithographic system characterized by comprising means to rotate or rotatingly



vibrate said convex mirror about a rotational axis which is parallel to a center axis of said convex mirror and which is eccentric to said convex mirror.

4,514,858

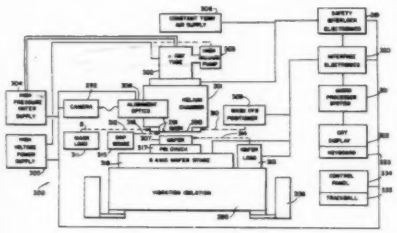
LITHOGRAPHY SYSTEM

W. Thomas Novak, San Jose, Calif., assignor to Micronix Partners, Los Gatos, Calif.

Filed Mar. 15, 1983, Ser. No. 475,430

Int. Cl.³ G01N *21/00, 23/00;* G03B *41/16*

U.S. Cl. 378—034 **4 Claims**



1. A lithography system for a substrate printing sequence comprising:

a beam chamber having a gaseous interior environment of high permeability to x-rays;

means for mounting a x-ray beam source adjacent one end of the chamber;

means for adjustably mounting a mask at a position across an opposite end of said chamber;

means for movably mounting a plurality of objective lenses in said chamber above said mask;

means for movably mounting a substrate in parallelism to and at a side of said mask opposite said source to receive a beam image extending through said mask;

means for providing alignment targets on each of said mask and said substrate; and

means, including a laser light source, said objective lenses and optics, for aligning said alignment targets on said mask with respect to said alignment targets on said substrate by relative movement of said mask and substrate with respect to each other, said optics being located exteriorly of said beam chamber.

4,514,859

COLLIMATOR FOR AN X-RAY EXAMINATION APPARATUS

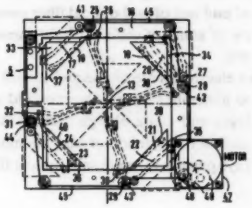
Günter Holzermer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,016

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234410

Int. Cl.³ G21F *5/04*

U.S. Cl. 378—152 **9 Claims**



1. A device for collimating a radiation beam comprising:

a first diaphragm means for acting on said radiation beam for defining a radiation cone having a selected rectangular cross-section;

a rectangular frame;

a second diaphragm means disposed after said first diaphragm means in the direction of propagation of said radiation beam, said second diaphragm means having four triangular diaphragm plates disposed in one plane at the corners of said rectangular radiation cone, each of said triangular diaphragm plates having an edge facing said radiation cone and a prallelogram linkage means connected therewith and connected to said rectangular frame for radially pivoting said plates toward an axis of symmetry of said device parallel to said radiation propagation direction from a standby position wherein said edges of said plates are respectively disposed substantially perpendicularly to each angle bisector of the corners of said frame and wherein said plates substantially do not act on said radiation cone, to selected central positions for defining a substantially circular radiation cone of selected diameter; and

a means for driving said parallelogram linkage means.

4,514,860

FIBER OPTICAL MEASURING DEVICE FOR MEASURING ELECTRICAL AND MAGNETIC QUANTITIES BY LATERALLY CONTROLLED PHOTO-LUMINESCENCE

Morgan Adolfsson; Torgny Brogardh; Bertil Hök, and Christer Ovrén, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed May 31, 1983, Ser. No. 499,487

Claims priority, application Sweden, Jun. 2, 1982, 8203391

Int. Cl.³ G01D *5/26*

U.S. Cl. 455—612 **18 Claims**

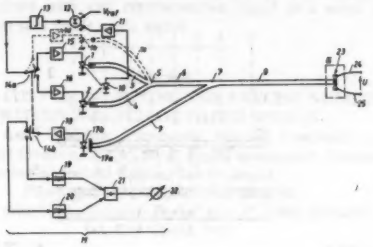
1. In a fiber optical measuring device which includes a transducer having a sensor element; a measuring electronic unit having two light-emitting means and a photodetector means, the first of said light-emitting means being capable of emitting a light ray having an emission spectra which is different from that of the second of said light-emitting means, and said photodetector means being capable of detecting photoluminescence emanating from said sensor element, and an optical fiber means which extends from said measuring electronic unit into said transducer so as to convey light rays from said two light-emitting means to said sensor element and to convey photolumines-

cence emitted from said sensor element to said photodetector means, the improvement wherein

said sensor element includes a luminescent layer which has a front surface and a rear surface, said optical fiber means having an end within said transducer which is directed towards the front surface of said luminescent layer,

an optical filter means is positioned between said end of said optical fiber means and the front surface of said luminescent layer, said optical filter means being oriented so as to be substantially perpendicular to the light rays passing out of said end of said optical fiber means, and having a plurality of zones of different light transmission characteristics, and

two electrodes are connected to said luminescent layer so as to generate a lateral electric field within said luminescent layer and cause charge carriers which have been generated in one portion of said luminescent layer by the light rays passing through said optical filter means and onto the front surface of said luminescent layer to accelerate to another portion of said luminescent layer, the photoluminescence produced by said relocated charge carriers being received by said photodetector.



DESIGN PATENTS

GRANTED APR. 30, 1985

ERRATA

For CLASS	See PATENT NO.
D02–279	278,608

278,565

SEAWEED PLATE GARNISH FOR A SUSHI DISH OR THE LIKE

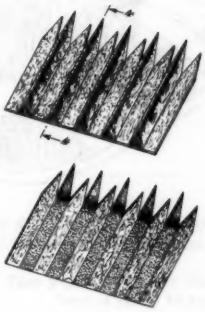
Chokichi Watanabe, 65, Aza-Kayamachi, Ohaza-Tahara, Tahara-cho, Atsumi-gun, Aichi-ken, Japan

Filed Sep. 10, 1981, Ser. No. 301,011

Claims priority, application Japan, Jul. 15, 1981, 56-30828

Term of patent 14 years

U.S. Cl. D1—123



278,566

GARMENT SLEEVE

Linda G. Gustafson, R.R. 1, Box 57, Milan, Minn. 56262

Filed Sep. 24, 1982, Ser. No. 423,238

Term of patent 14 years

U.S. Cl. D2—25

278,567

MARTIAL ARTS LEG AND FOOT PROTECTOR

Ronald Rasmussen, 4430 Olympus Dr. NE., Bremerton, Wash. 98310

Filed Jul. 12, 1982, Ser. No. 397,505

Term of patent 14 years

U.S. Cl. D2—27

278,568

SWIMWEAR

Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406

Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,334

Term of patent 14 years

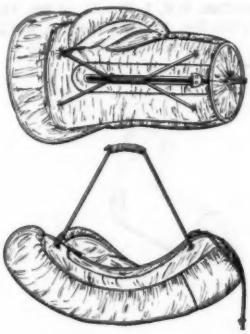
U.S. Cl. D2—40

278,569
SWIMWEAR
Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406
Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,643
Term of patent 14 years
U.S. Cl. D2—40

278,570
SKI BOOT
Mariano Sartor, Montebelluna, and Renzo Balbinot, Vittorio Veneto, both of Italy, assignors to Nordica S.p.A, Montebelluna, Italy
Filed Oct. 4, 1982, Ser. No. 432,528
Claims priority, application Italy, Apr. 5, 1982, 21443/82[U]
Term of patent 14 years
U.S. Cl. D2—276

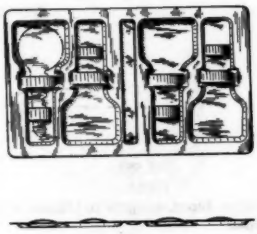
278,571
MASSEUR SANDAL
Gabriel Eber, 80 Borgah St., Carss Park, New South Wales 2221, Australia
Filed Jan. 22, 1982, Ser. No. 341,688
Claims priority, application Australia, Sep. 11, 1981, 85211
Term of patent 14 years
U.S. Cl. D2—293

278,572
TOTE BAG
Emilio Gargioni, Strada Castelvecchio 16, Moncalieri, Turin, Italy
Filed Dec. 10, 1982, Ser. No. 448,428
Term of patent 14 years
U.S. Cl. D3—44



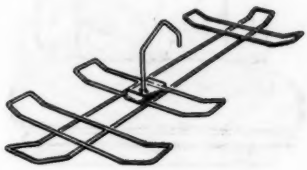
278,573
PANELLED BAGGAGE UNIT
Piero Mannato, Bologna, Italy, assignor to Plastimoda Italiana S.r.l., Granarolo dell'Emilia, Italy
Filed Feb. 22, 1982, Ser. No. 350,779
Claims priority, application Italy, Sep. 11, 1981, 4988/81[U]
Term of patent 14 years
U.S. Cl. D3—48

278,574
SPARE KEY HOLDER OR SIMILAR ARTICLE
George N. Kilpatrick, 11859 Edgewater Dr., Lakewood, Ohio 44107
Filed Sep. 27, 1982, Ser. No. 423,686
Term of patent 14 years
U.S. Cl. D3—61

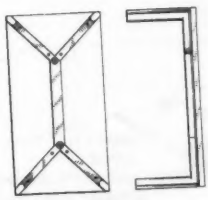


278,575
KEY-HOLDER
Antoine Bassani, 2015 Drummond St., Ste. 912, Montreal, Quebec, Canada H3G 1W7
Filed Nov. 29, 1982, Ser. No. 445,443
Claims priority, application Canada, Jun. 9, 1982, 09-06-82-2
Term of patent 14 years
U.S. Cl. D3—61

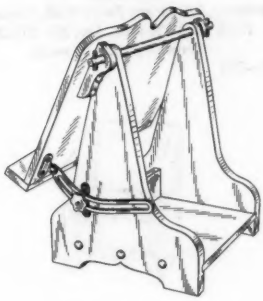
278,576
HANGER
Bernard W. Rivkin, San Diego, and Charles R. Leaf, Escondido, both of Calif., assignors to P.P.M.D., San Diego, Calif.
Filed Mar. 26, 1982, Ser. No. 362,088
Term of patent 14 years
U.S. Cl. D6—317



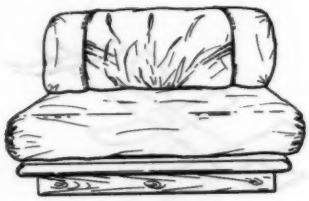
278,577
TABLE
Charles Gwathmey, New York, and Robert Siegel, Bedford, both of N.Y., assignors to Knoll International, Inc., New York, N.Y.
Filed Jun. 10, 1982, Ser. No. 387,006
Term of patent 14 years
U.S. Cl. D6—484



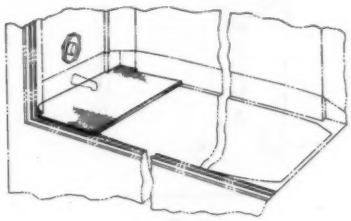
278,578
BOOK HOLDER
Robert L. Jensen, 10000 NE. 37th St., Vancouver, Wash. 98662
Filed Aug. 2, 1982, Ser. No. 404,624
Term of patent 14 years
U.S. Cl. D6—419



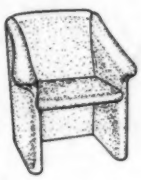
278,579
SEAT
Victor A. Milles, Wil, Switzerland, assignor to Fratelli Saporiti Industria Arredamenti di Saporiti Sergio E Giorgio S.N.C., Besnate, Italy
Filed Sep. 10, 1982, Ser. No. 416,445
Term of patent 14 years
U.S. Cl. D6—334



278,580
REVERSIBLE SEAT FOR A BATHTUB OR THE LIKE
Robert T. Collins, 309 Yorkum Pkwy., Apartment No. 1802, Alexandria, Va. 22304
Filed Jan. 7, 1983, Ser. No. 456,573
Term of patent 14 years
U.S. Cl. D6—349

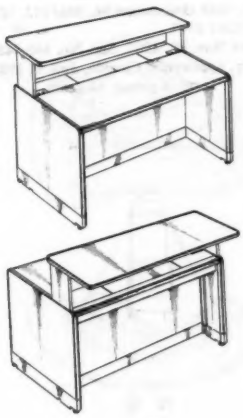


278,581
CHAIR
Merle C. Melchior, 723 Ocean Front Walk, Venice, Calif. 90291
Filed May 12, 1982, Ser. No. 377,297
Term of patent 14 years
U.S. Cl. D6—373

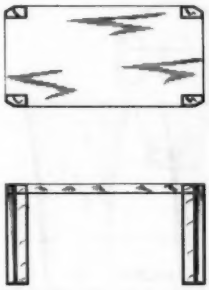


278,582
LOUNGE CHAIR
Joel A. Kramer, Bradenton, Fla., and Alton A. Harper, Tustin, Calif., assignors to Tropitone Furniture Co., Inc., Sarasota, Fla.
Filed Sep. 29, 1982, Ser. No. 432,108
The portion of the term of this patent subsequent to Nov. 27, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—373

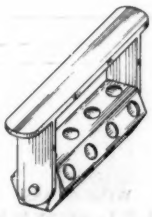
278,583
DESK
Seiji Koguma, Tokyo, Japan, assignor to Okamura Corporation, Yokohama, Japan
Filed Feb. 3, 1983, Ser. No. 463,390
Term of patent 14 years
U.S. Cl. D6—426



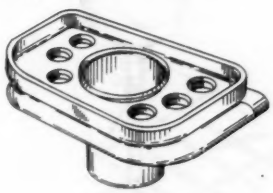
278,584
TABLE
R. Scott Bromley, New York, N.Y., assignor to Cartier Inc., New York, N.Y.
Filed Oct. 7, 1982, Ser. No. 433,354
Term of patent 14 years
U.S. Cl. D6—484



278,585
ROTATABLE STORAGE RACK FOR SPICE JARS AND THE LIKE
Rodnie D. Oldham, 10295 Virginia Swan Pl., Cupertino, Calif. 95014
Filed Sep. 13, 1982, Ser. No. 416,865
Term of patent 14 years
U.S. Cl. D6—513



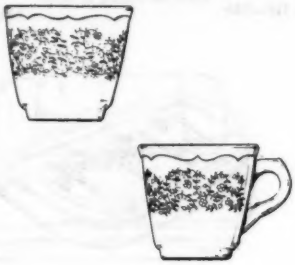
278,586
COMBINED TOOTHBRUSH AND TUMBLER HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Dec. 3, 1982, Ser. No. 446,853
Claims priority, application Australia, Oct. 12, 1982, 1818/82
Term of patent 14 years
U.S. Cl. D6—531



278,587
SOAP HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Dec. 3, 1982, Ser. No. 446,770
Claims priority, application Australia, Oct. 12, 1982, 1817/82
Term of patent 14 years
U.S. Cl. D6—540

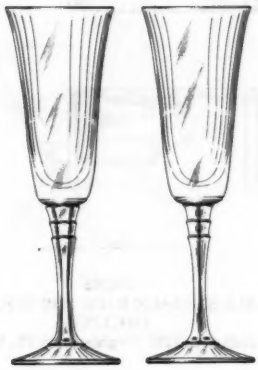
278,588
BOWL
Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra-Stone, Inc., Prior Lake, Minn.
Filed Jun. 17, 1982, Ser. No. 389,425
The portion of the term of this patent subsequent to Dec. 6, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—29

278,589
CUP OR SIMILAR ARTICLE
Simone Colquitt, Bronxville, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,169
Term of patent 14 years
U.S. Cl. D7—9



278,590
CHAMPAGNE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 402,987
The portion of the term of this patent subsequent to Apr. 9, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

278,591
CHAMPAGNE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 403,143
The portion of the term of this patent subsequent to Apr. 9, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

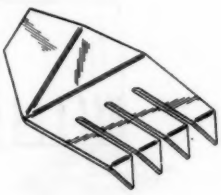


278,592
WINE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 403,145
The portion of the term of this patent subsequent to Apr. 9, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

278,593
RATCHET HANDLE FOR HAND TOOL
Francis W. MacGregor, New Britain, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jun. 28, 1982, Ser. No. 392,807
Term of patent 14 years
U.S. Cl. D8—83

278,594
RATCHET WRENCH SOCKET UNIT NUT EJECTOR SPRING RETAINER
Howard D. Lye, 317 N. 16th East, Riverton, Wyo. 82501
Filed Jul. 30, 1982, Ser. No. 403,558
Term of patent 14 years
U.S. Cl. D8—25

278,595
FASTENER FOR EXHAUST AIR VALVES
Lennart Widerby, Jönköping, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden
Filed Jul. 23, 1982, Ser. No. 401,130
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, URA 78/82
Term of patent 14 years
U.S. Cl. D8—389

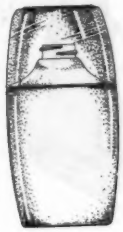


278,596
PACKAGING CONTAINER
Salvatore M. Ceraulo, 162 Noel Dr., Amherst, N.Y. 14226
Filed Sep. 29, 1982, Ser. No. 427,638
Term of patent 14 years
U.S. Cl. D9—341

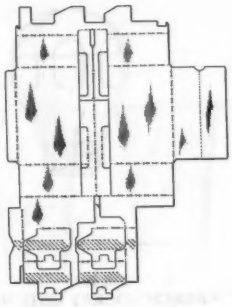
278,597
BOTTLE
Daniel McAlinden, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.
Filed Nov. 22, 1982, Ser. No. 443,466
Term of patent 14 years
U.S. Cl. D9—349

278,598
COMBINED BOTTLE AND CAP
Heinz Weber, 14 Lakeview Blvd., Beaconsfield, Quebec, Canada
Filed Nov. 16, 1982, Ser. No. 442,023
Term of patent 14 years
U.S. Cl. D9—353

278,599
BOTTLE
James Lane, Unionville, Canada, assignor to The Drackett Company, Cincinnati, Ohio
Filed Mar. 18, 1982, Ser. No. 359,533
Term of patent 14 years
U.S. Cl. D9—377



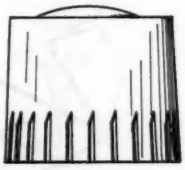
278,601
ARTICLE CARRIER BLANK
Jerry F. Wilson, West Monroe, La., assignor to Manville Service Corporation, Denver, Colo.
Filed Jun. 14, 1982, Ser. No. 387,891
Term of patent 14 years
U.S. Cl. D9—433



278,602
PLASTIC THREADED COVER FOR A CONTAINER
Florence Rosenstein, 67 W. Euclid St., Valley Stream, N.Y. 11580
Filed Nov. 19, 1982, Ser. No. 443,121
Term of patent 14 years
U.S. Cl. D9—449

278,600
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Jun. 21, 1982, Ser. No. 390,019
Term of patent 14 years
U.S. Cl. D9—399

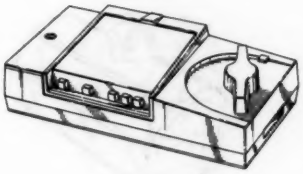
278,603
CONTAINER CAP
John H. Morgan, Chatham, and John A. Grip, Wayne, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Mar. 18, 1983, Ser. No. 476,903
Term of patent 14 years
U.S. Cl. D9—453



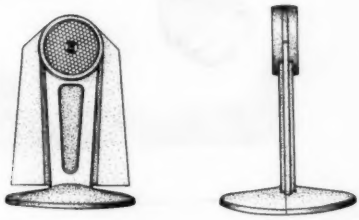
278,604
DISPLAY HOLDER FOR A CONTAINER OF LIPSTICK OR THE LIKE
John M. Van Zandt, 15932 Northfield, Pacific Palisades, Calif. 90272
Filed Jan. 20, 1983, Ser. No. 459,519
Term of patent 14 years
U.S. Cl. D9—457

278,605
WATCH CASE
Carol Didisheim, Bienne, Switzerland, assignor to Omega Louis Brandt & Frere S.A., Bienne, Switzerland
Filed May 26, 1982, Ser. No. 382,444
Claims priority, application Switzerland, Dec. 23, 1981, 72 034
Term of patent 14 years
U.S. Cl. D10—30

278,606
GRAIN MOISTURE METER
Shigeo Suzuki, 4-1 Yamana-cho, Fukuroi 437, Japan
Filed Sep. 3, 1982, Ser. No. 414,776
Claims priority, application United Kingdom, May 18, 1982, 1006783
Term of patent 14 years
U.S. Cl. D10—56

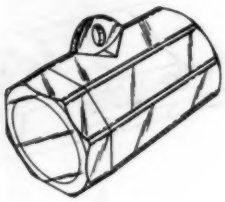


278,607
ROAD REFLECTOR OR SIMILAR ARTICLE
Heinz Tichy, Vienna, and Franz Mair, Birgitz, both of Austria, assignors to Semperit Aktiengesellschaft, Traiskirchen, Austria
Filed Aug. 16, 1982, Ser. No. 408,272
Claims priority, application Austria, Apr. 22, 1982, 526,335
Term of patent 14 years
U.S. Cl. D10—111



278,608
TOED SHOE
Sara R. Thompson, c/o Kenneth R. Matticks, P.O. Box 773, Wilmington, Ohio 45177
Filed Sep. 13, 1982, Ser. No. 416,873
Term of patent 14 years
U.S. Cl. D2—279

278,609
PENDANT MEDICAL MICROFILM READER
Joanne Satterelli, Jackson, Mich., assignor to National Child Safety Council, Jackson, Mich.
Filed Jun. 13, 1983, Ser. No. 503,714
Term of patent 14 years
U.S. Cl. D11—2



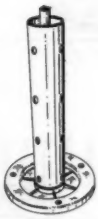
278,610
FINGER RING
Graham R. Gramwell, Birmingham, England, assignor to Steward Smith Investments Limited, Wales
Filed Sep. 16, 1982, Ser. No. 418,617
Term of patent 14 years
U.S. Cl. D11—30

278,611
APPLE-SHAPED BROACH
Barbara S. Sussman, and Sybil Baiman, both of Allentown, Pa., assignors to Jewish Federation of Allentown, Allentown, Pa.
Filed Sep. 2, 1982, Ser. No. 414,221
Term of patent 14 years
U.S. Cl. D11—67

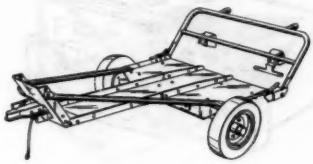
278,612
EMBLEM FOR JEWELRY OR THE LIKE
Sven Tore K. Hjelm, Box 146, S-534 00 Vara, Sweden
Filed Jan. 10, 1983, Ser. No. 456,750
Claims priority, application Sweden, Jul. 13, 1982, 82-1840
Term of patent 14 years
U.S. Cl. D11—107

278,613
PLANTER
Kenneth D. Einsel, 903 N. Saint Joseph Ave., Hastings, Nebr. 68901
Continuation-in-part of Ser. No. 239,638, Mar. 2, 1981, abandoned. This application Dec. 10, 1982, Ser. No. 448,596
Term of patent 14 years
U.S. Cl. D11—152

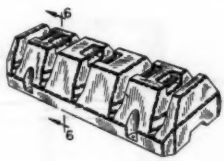
278,614
CONTAINER FOR MULTIPLE PLANT GROWTH
Howard E. Moss, Commerce, Okla., assignor to Howard Enterprises, Inc., Commerce, Okla.
Filed Apr. 20, 1983, Ser. No. 486,932
Term of patent 14 years
U.S. Cl. D11—152



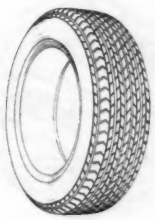
278,615
TRAILER FOR A THREE-WHEEL CYCLE OR THE LIKE
Denny B. Law, San Marcos, and Bernhardt P. Goettker, Escondido, both of Calif., assignors to Unique Functional Products, San Marcos, Calif.
Filed Apr. 19, 1982, Ser. No. 369,518
Term of patent 14 years
U.S. Cl. D12—101



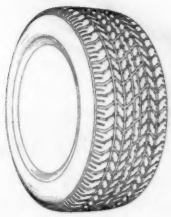
278,616
BICYCLE STAND
Robert M. Collison, 11621 NE. Fargo St., Portland, Oreg. 97220, and John V. Myers, 9950 SW. Riverwood La., Tigard, Oreg. 97223
Filed Aug. 9, 1982, Ser. No. 406,394
Term of patent 14 years
U.S. Cl. D12—115



278,617
VEHICLE TIRE
Hiroshi Kojima; Misao Kawabata, both of Tokyo; Masataka Yamaoka, Saitama, and Masashiro Moriya, Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1983, Ser. No. 456,456
Claims priority, application Japan, Jul. 29, 1982, 57-34004
Term of patent 14 years
U.S. Cl. D12—147

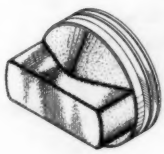


278,618
VEHICLE TIRE
Hiroshi Kojima, Tokyo; Misao Kawabata; Masataka Yamaoka, both of Saitama, and Masashiro Moriya, Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed May 9, 1983, Ser. No. 492,753
Claims priority, application Japan, Nov. 16, 1982, 57-51413
Term of patent 14 years
U.S. Cl. D12—147



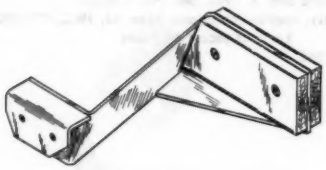
278,619
OIL COOLER
Noriyuki Hoshina, Hatano, Japan, assignor to Toyo Radiator Co., Ltd., Tokyo, Japan
Filed Sep. 3, 1982, Ser. No. 418,100
Claims priority, application Japan, Mar. 13, 1982, 57-10392
Term of patent 14 years
U.S. Cl. D12—166

278,620
BICYCLE BRAKE SHOE
Richard C. Everett, West Linn, Oreg., assignor to Kool-Stop International, Inc., Lake Oswego, Oreg.
Filed Aug. 30, 1982, Ser. No. 412,787
Term of patent 14 years
U.S. Cl. D12—180

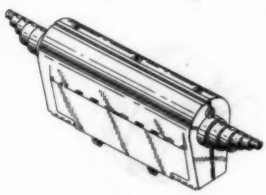


278,621
AUTOMOBILE FENDER SKIRT ORNAMENT
Wesley Scher, 1122 N. Kings Rd., Los Angeles, Calif. 90069
Filed Apr. 25, 1983, Ser. No. 488,053
Term of patent 14 years
U.S. Cl. D12—190

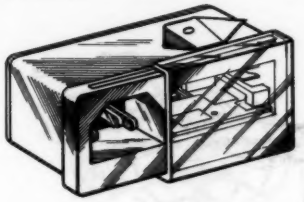
278,622
AUXILIARY ENGINE MOUNT FOR A BOAT TRANSOM
Gary B. Hunnell, 4038 E. University, Des Moines, Iowa 50317
Filed Jul. 6, 1982, Ser. No. 395,318
Term of patent 14 years
U.S. Cl. D12—317



278,623
TELEPHONE WIRE AERIAL ENCLOSURE
Lyle R. Anderson, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 5, 1982, Ser. No. 405,354
Term of patent 14 years
U.S. Cl. D13—24

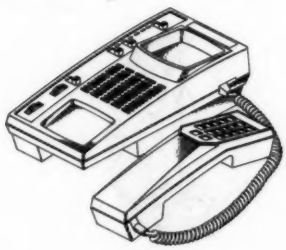


278,624
ELECTRICAL POWER MODULE
Davis P. Stone, Canyon Country, Calif., assignor to Hopkins Engineering Company, Calif.
Filed Jun. 29, 1983, Ser. No. 509,216
Term of patent 14 years
U.S. Cl. D13—24

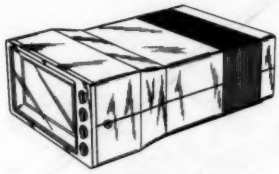


278,625
MICROPHONE
Hilmer Mathiasen, Holte, Denmark, assignor to Bruel & Kjaer A/S, Naerum, Denmark
Filed Jan. 7, 1983, Ser. No. 456,435
Claims priority, application Denmark, Jul. 12, 1982, 667; Jul. 12, 1982, 668
Term of patent 14 years
U.S. Cl. D14—12

278,626
MOBILE TELEPHONE SET
Hisamitsu Takagi, Inagi; Hiroichi Hashiguchi, Kawasaki, and Tomoyuki Takehara, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Nov. 29, 1982, Ser. No. 445,047
Claims priority, application Japan, May 31, 1982, 57-23938
Term of patent 14 years
U.S. Cl. D14—53

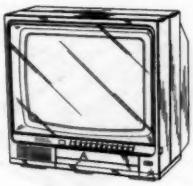


278,627
TELEVISION MONITOR
Taisuke Kashima; Shigeki Gushiken; Yukio Kuroiwa, all of Tokyo; Tohru Kiyota, Tachikowa, and Takashi Fujii, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 26, 1982, Ser. No. 444,708
Claims priority, application Japan, Jul. 2, 1982, 57-29535
Term of patent 14 years
U.S. Cl. D14—77

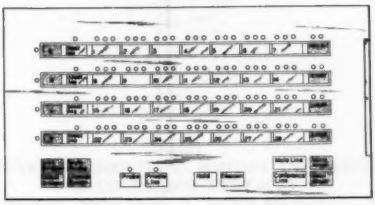


278,628
PORTABLE TELEVISION RECEIVER
Naoto Fukasawa; Susumu Suzuki, and Noritaka Uchihori, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Dec. 14, 1982, Ser. No. 449,816
Claims priority, application Japan, Jun. 15, 1982, 57-26706
Term of patent 14 years
U.S. Cl. D14—77

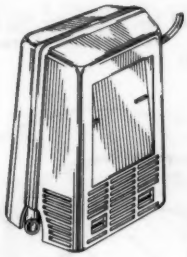
278,629
TELEVISION RECEIVER
Kiyoshi Mitani, Kyoto; Hiroshi Yonekura, Osaka; Kiyoshi Suzuki, Osaka, and Osamu Sugihara, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 389,795
Claims priority, application Japan, Mar. 8, 1982, 57-9407
Term of patent 14 years
U.S. Cl. D14—80



278,630
CONSOLE FACEPLATE FOR TELECONFERENCING BRIDGE
Alfred R. Ender, West Windsor Township, Mercer County; Robert F. Iacullo, Tenafly; Richard J. Kriete, Little Ferry; Alvin R. Tilley, Middletown, and Leon Weinglass, Edison, all of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.
Filed Dec. 27, 1982, Ser. No. 453,005
Term of patent 14 years
U.S. Cl. D14—115

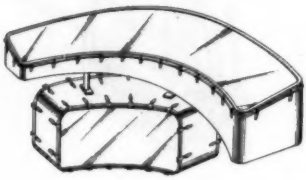


278,631
EVAPORATIVE COOLER PUMP
Frederick A. Major, deceased, late of Tempe, Ariz. (by Clare M. Major, personal representative), assignor to Clare M. Major, Tempe, Ariz.
Filed Jul. 6, 1982, Ser. No. 395,496
Term of patent 14 years
U.S. Cl. D15—7



278,632
GUITAR
Mark Erlewine, 1605 Wethersfield Rd., Austin, Tex. 78703
Filed Sep. 29, 1982, Ser. No. 426,848
Term of patent 14 years
U.S. Cl. D17—14

278,633
DRUM SET
Steven J. DeBarbrie, 13558 Moorpark Ave. #8, Sherman Oaks, Calif. 91423
Filed Jun. 3, 1982, Ser. No. 384,643
Term of patent 14 years
U.S. Cl. D17—22



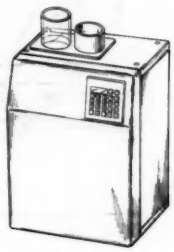
278,634
DOUBLE TIPPED DRUMSTICK
Jim Anderson, 918 Brent Cir., Placentia, Calif. 92670
Filed Sep. 13, 1982, Ser. No. 416,876
Term of patent 14 years
U.S. Cl. D17—22

278,635
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of, Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,325
Claims priority, application Japan, Jan. 11, 1983, 58-509
Term of patent 14 years
U.S. Cl. D18—1

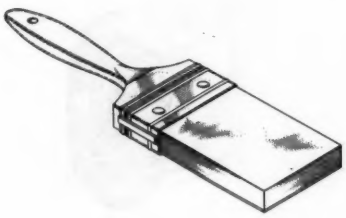
278,636
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of, Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,326
Claims priority, application Japan, Jan. 11, 1983, 58-511
Term of patent 14 years
U.S. Cl. D18—1

278,637
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,344
Claims priority, application Japan, Jan. 22, 1983, 58-508
Term of patent 14 years
U.S. Cl. D18—1

278,638
PNEUMATIC CONVEYOR TERMINAL
Herbert Kraemer, Fasanenweg 6, 8080 Fuerstenfeldbruck, Fed. Rep. of Germany
Filed Sep. 20, 1982, Ser. No. 420,375
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 12867
Term of patent 14 years
U.S. Cl. D18—35

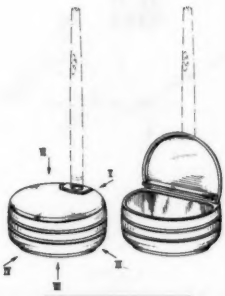


278,639
NOTE PAD HOLDER
Carl G. Cantonis, 2040 Redondo Place, Fullerton, Calif. 92635
Filed Apr. 28, 1982, Ser. No. 372,468
Term of patent 14 years
U.S. Cl. D19—28



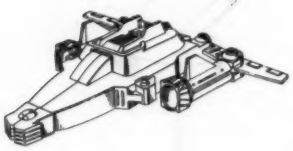
278,640
PAD OF PAPER
Gary Multer, 41 Regent St., Cambridge, Mass. 02140
Filed May 24, 1982, Ser. No. 381,141
Term of patent 14 years
U.S. Cl. D19—28

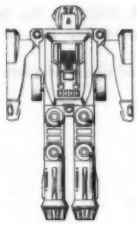
278,641
COMBINED HOLDER FOR A WRITING INSTRUMENT AND COVERED RECEPTACLE
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed Jul. 15, 1982, Ser. No. 398,340
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, MR 141
Term of patent 14 years
U.S. Cl. D19—77



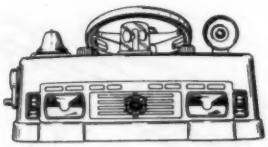
278,642
FOOTBALL CLAPPER
Ernest Martinez, 1009 W. Arlington, Fort Worth, Tex. 76110
Filed Dec. 6, 1982, Ser. No. 447,263
Term of patent 14 years
U.S. Cl. D21—64

278,643
RECONFIGURABLE TOY
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jul. 29, 1983, Ser. No. 518,376
Term of patent 14 years
U.S. Cl. D21—128



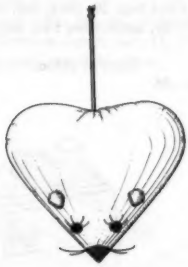


278,644
DRIVING TOY
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Susumu Matsumoto, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Aug. 2, 1982, Ser. No. 404,061
Claims priority, application Japan, Apr. 15, 1982, 57-16294
Term of patent 14 years
U.S. Cl. D21—142



278,645
TOY POODLE FIGURE
Jacob Nielsen, Copenhagen, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,760
Term of patent 14 years
U.S. Cl. D21—161

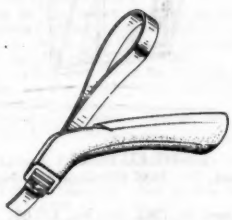
278,646
STUFFED NOVELTY MOUSE FIGURE OR THE LIKE
Kenneth H. McCoy, 3107 - 17th St., Santa Monica, Calif. 90405
Filed Sep. 24, 1982, Ser. No. 422,717
Term of patent 14 years
U.S. Cl. D21—188



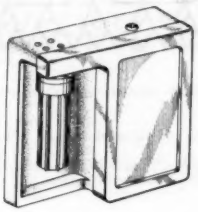
278,647
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,372
Term of patent 14 years
U.S. Cl. D21—190

278,648
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,437
Term of patent 14 years
U.S. Cl. D21—190

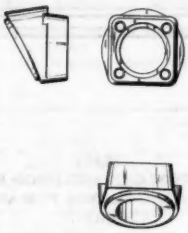
278,649
SKI POLE GRIP
Peter Nordgren, and Hans Sjöholm, both of Stockholm, Sweden, assignors to Formelprodukter, Luleå , Sweden
Filed Mar. 26, 1982, Ser. No. 362,313
Claims priority, application Sweden, Oct. 5, 1981, 81-2184
Term of patent 14 years
U.S. Cl. D21—230



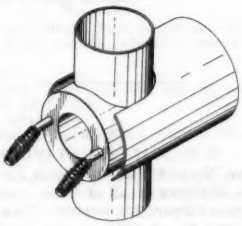
278,650
WATER PURIFIER
Jack P. Slovak, 8952 Sailport, Huntington Beach, Calif. 92646; Robert A. Slovak, 411 E. Edgewater, Newport Beach, Calif. 92660, and Douglas M. Horn, 3731 Bates, Irvine, Calif. 92714
Filed Sep. 30, 1982, Ser. No. 432,153
Term of patent 14 years
U.S. Cl. D23—3



278,651
VALVE ADAPTOR FOR LPG FUEL TANK
Michael A. Hornak, Walnut, Calif., assignor to Calnetics Corporation, Walnut, Calif.
Filed Apr. 26, 1982, Ser. No. 371,544
Term of patent 14 years
U.S. Cl. D23—40



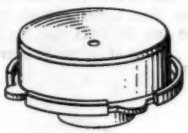
278,652
HEAT SAVING DEVICE
Donald A. Lindsey, Rte. 7, Box 7095-C, Nampa, Id. 83651
Filed Jun. 20, 1983, Ser. No. 505,851
Term of patent 14 years
U.S. Cl. D23—136



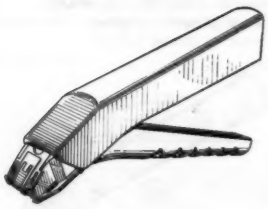
278,653
CENTRIFUGE TUBE FOR SEPARATING AND WASHING RED BLOOD CELLS
Steven R. Savitz, Teaneck; Johnna B. Hawk, Rocky Hill; Henry A. Graham, Jr., Annandale, and Rosemary K. Chachowski, Manville, all of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.
Filed Aug. 17, 1982, Ser. No. 408,961
Term of patent 14 years
U.S. Cl. D24—22

278,654
ANASTOMOSIS FRAME
Timothy M. Scanlan, St. Paul, Minn., assignor to Scanlan International, Inc., St. Paul, Minn.
Filed Sep. 29, 1982, Ser. No. 426,688
Term of patent 14 years
U.S. Cl. D24—27

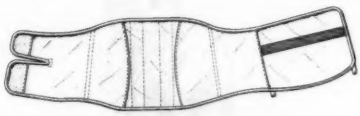
278,655
COMBINED BOTTOM CAP AND DROP FORMER WITH A SENSOR-MOUNTING FLANGE FOR AN I.V. BURETTE CHAMBER
Brian A. Scappaticci, Encinitas, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Sep. 13, 1982, Ser. No. 417,125
Term of patent 14 years
U.S. Cl. D24—52



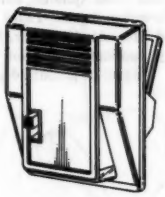
278,656
SURGICAL SKIN STAPLER
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard H. Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed May 5, 1982, Ser. No. 375,003
Term of patent 14 years
U.S. Cl. D24—26



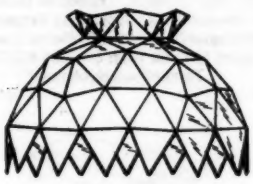
278,657
MEDICAL CORSET
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jul. 9, 1982, Ser. No. 396,988
Claims priority, application Japan, Mar. 3, 1982, 57-8690
Term of patent 14 years
U.S. Cl. D24—64



278,658
CLIP LIGHT FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,855
Claims priority, application Japan, Oct. 8, 1982, 57-36273
Term of patent 14 years
U.S. Cl. D26—60



278,659
LIGHT FIXTURE
Lawrence E. Lodrick, Sr., 2436 Harrison Ave. N., Rochester, Mich. 48063
Filed Sep. 29, 1982, Ser. No. 428,001
Term of patent 14 years
U.S. Cl. D26—85



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.Ahlstrom Osakeyhtio: *See*—
Heikkila, Sakari; and Tiuri, Martti, 4,514,680, Cl. 324-58.50A.

A. Klebes GmbH & Co. K.G. Kunststoff- und Metallwarenfabrik: *See*—
Luttgens, Werner, 4,513,798, Cl. 144-28.110.

A/S Westad Armaturfabrik: *See*—
Rishovd, Erik; and Sorensen, Sven, 4,513,765, Cl. 137-72.000.

AB ASEA-ATOM: *See*—
Borrman, Bo; Hellman, Erik; Ode, Bengt; and van Santen, Aart, 4,514,358, Cl. 376-362.000.

AB Rollab: *See*—
Nelander, Curt, 4,513,610, Cl. 73-147.000.

AB Volvo: *See*—
Udd, Soren, 4,513,729, Cl. 123-563.000.

Abdelmonem, Nabil: *See*—
Ringel, Helmut; Zimmer, Erich; and Abdelmonem, Nabil, 4,514,296, Cl. 210-96.100.

Abe, Hiroshi; Sato, Nobuhiro; Ono, Kimizo; and Hirano, Kazuo, to Sumitomo Electric Industries, Ltd.; Abe, Hiroshi; and Sato, Nobuhiro. Method for measuring oxygen metabolism in internal organ or tissue. 4,513,751, Cl. 128-666.000.

Abe, Masatoshi, to Okamura Corporation. Pivot angle adjusting means for the arm of a material handling device. 4,514,136, Cl. 414-744.00A.

Abeles, Benjamin: *See*—
Tiedje, Thomas; and Abeles, Benjamin, 4,514,582, Cl. 136-256.000.

Abney, Paul A.: *See*—
Martell, Charles R.; Isett, Donald D.; and Abney, Paul A., 4,513,676, Cl. 112-262.100.

Ackerman, Walter T.; and Klimeck, Edward F., to Eyelet Specialty Co., Inc. Cosmetic container construction. 4,514,102, Cl. 401-78.000.

Acme Resin Corporation: *See*—
Laitar, Robert A., 4,514,316, Cl. 252-182.000.

Acrometal Products, Inc.: *See*—
Steinback, Clarence I., 4,513,539, Cl. 51-138.000.

Acrowood Corporation: *See*—
Terrenzio, Gabriel M., 4,513,919, Cl. 241-275.000.

Adams, Anthony L., to Texas Instruments Incorporated. Integrated circuit package having interconnected leads adjacent the package ends. 4,514,750, Cl. 357-70.000.

Adams, George W.; and Banter, C. Bruce, to Emhart Industries, Inc. Mounting means for timer-motor assembly. 4,514,105, Cl. 403-24.000.

Adams, James B., Jr., to Otis Engineering Corporation. Valve with latching means. 4,513,944, Cl. 251-89.000.

Adcock, DL. Method and device for filtering lubricating oil for a dough divider machine. 4,513,614, Cl. 73-169.000.

Addison, Charles: *See*—
Olson, Harold D.; Addison, Charles; and Cagle, J. Douglas, 4,513,476, Cl. 17-44.100.

ADIR: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,398, Cl. 514-245.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,399, Cl. 514-241.000.

Adolfsson, Morgan; Brogardh, Iorgny; Hok, Bertil; and Ovren, Christer, to ASEA Aktiebolag. Fiber optical measuring device for measuring electrical and magnetic quantities by laterally controlled photoluminescence. 4,514,860, Cl. 455-612.000.

Adriaensen, Ludo: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,514,520, Cl. 502-337.000.

Advanced Micro Devices, Inc.: *See*—
Sfarti, Adrian, 4,514,673, Cl. 318-685.000.

Aero-Safe Technologies Inc.: *See*—
Kenzie, E. Dennis, 4,513,931, Cl. 244-152.000.

Agbay, Anthony J., to Omco Inc. Barrel lock. 4,513,592, Cl. 70-34.000.

Agbay, Anthony J.: *See*—
Carlson, John H.; and Agbay, Anthony J., 4,513,591, Cl. 70-34.000.

Agency of Industrial Science & Technology: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Wakabayashi, Hajimu; Terai, Ryohei; Yamanaka, Hiroshi; and Hara, Shigeo, 4,514,329, Cl. 252-629.000.

AGFA Gevaert Aktiengesellschaft: *See*—
Koninger, Horst; Lehnert, Klaus; and Schirk, Gunter, 4,514,071, Cl. 354-320.000.

Agfa-Gevaert N.V.: *See*—
Lemahieu, Raymond G.; and Janssens, Wilhelmus, 4,514,494, Cl. 430-376.000.

Agner, Jennings M.: *See*—
Pittman, Luther B.; Agner, Jennings M.; and Hunt, George F., 4,513,756, Cl. 131-111.000.

Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., to International Business Machines Corporation. Methods for partitioning mainframe instruction sets to implement microprocessor based emulation thereof. 4,514,803, Cl. 364-200.000.

Agro, Ignatius T.: *See*—
Shvakhman, Lidia; Agro, Ignatius T.; and Chiusolo, Louis L., 4,514,538, Cl. 524-315.000.

Aguirre, Everado M. Nursing bottle support. 4,513,935, Cl. 248-105.000.

Ahlstrom, John K.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, to Siemens Aktiengesellschaft. Method for the preparation of orientation layers for liquid crystal displays and liquid crystal displays having orientation layers. 4,514,043, Cl. 350-341.000.

Ahuja, Sudhir R., to AT&T Bell Laboratories. Store group bus allocation system. 4,514,728, Cl. 340-825.500.

Aichi Spinning Co., Ltd.: *See*—
Imoda, Kinichiro; Kawai, Toshinori; and Nishitani, Kimio, 4,513,921, Cl. 242-36.000.

Air-O-Lator Corporation: *See*—
Cramer, Barry G.; and Cramer, Roy A., 4,514,343, Cl. 261-37.000.

Air Products and Chemicals, Inc.: *See*—
Bonney, Glenn E.; and Longsworth, Ralph C., 4,514,204, Cl. 62-41.000.
Wells, James E., 4,514,567, Cl. 544-352.000.

Ajinomoto Co., Inc.: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.

Akashi, Yukimasa, to Showa Seiki Kabushiki Kaisha. Tap holder. 4,514,115, Cl. 408-139.000.

Aki, Osami: *See*—
Ochiai, Michihiko; Okada, Taiiʻi; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.

Akino, Hisashi: *See*—
Taguchi, Toshio; Akino, Hisashi; and Nozawa, Takamitsu, 4,513,877, Cl. 220-335.000.

Aktiebolaget Electrolux: *See*—
Andersson, Karl F.; and Eriksson, Bolik A. G., 4,513,579, Cl. 62-176.200.

Akzo nv: *See*—
Vrouenraets, Cornelius M. F., 4,514,472, Cl. 428-220.000.

Albanese, Andres, to AT&T Bell Laboratories. Packet switched communication system comprising collision avoidance means. 4,514,843, Cl. 370-93.000.

Alberts, Heinrich: *See*—
Resz, Raoul; Alberts, Heinrich; Burgdorfer, Hans-Heribert; and El Sayed, Aziz, 4,514,546, Cl. 525-57.000.

Albrass Enterprises, Inc.: *See*—
Alperin, Marvin; and Brasswer, Joseph L., 4,513,940, Cl. 248-674.000.

Alcan International Limited: *See*—
Sivilotti, Olivo G., 4,514,269, Cl. 204-69.000.

Alcon Laboratories, Inc.: *See*—
Damani, Nalinkant C.; Bhagat, Haresh G.; and McElhaney, Ramon L., 4,514,385, Cl. 424-81.000.

Aldinger, Fritz; Bischoff, Albrecht; Keilberth, Richard; and Sperner, Franz, to Heraeus Quarschmelze GmbH. Electrode connecting cable for cardiac pacemaker. 4,514,589, Cl. 174-119.00R.

Alexander, Garold W.; and Haase, William H., to International Paper Company. Apparatus and method for forming a multi-compartmented tray from a sheet material. 4,514,353, Cl. 264-294.000.

Alexander, John H., to International Standard Electric Corporation. Dielectric materials. 4,514,441, Cl. 427-126.600.

Alexander, William, to American Colloid Company. Hydrogen enriched water swellable clay having reduced acid demand and stable at low pH. 4,514,510, Cl. 501-148.000.

Alexandra Enterpises, Inc.: *See*—
Kuhnsman, Alexandra; and Morey, Marian B., 4,513,692, Cl. 119-109.000.

Alkem GmbH: *See*—
Stoll, Wolfgang; and Ennerst, Karl, 4,514,364, Cl. 423-4.000.

Allegheny Ludlum Steel Corporation: *See*—
Tommaney, Joseph W.; and Bishop, Harry L., Jr., 4,514,220, Cl. 75-60.000.

Allen, Sebree J. Drag reducing device for barges. 4,513,679, Cl. 114-67.00A.

Allied Corporation: *See*—
Justice, Bruce H.; and Aycock, Robert F., 4,514,440, Cl. 427-85.000.
Pez, Guido P., 4,514,337, Cl. 260-429.300.

Allis-Chalmers Corporation: *See*—
Hansen, Kenneth N., 4,513,847, Cl. 192-4.00A.
Patchen, Paul, II, 4,513,695, Cl. 123-41.100.
Plate, John R., 4,513,850, Cl. 192-3.580.

Almqvist, Bert: *See*—
Persbeck, Sven-Eric; and Almqvist, Bert, 4,513,830, Cl. 177-1.000.

Alperin, Marvin; and Brasswer, Joseph L., to Albrass Enterprises, Inc. Means and method for attaching fan and fixture units or the like substantially flush with a ceiling. 4,513,940, Cl. 248-674.000.

Alps Electric Co., Ltd.: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,514,740, Cl. 346-139.00R.
Koyama, Shoichi; and Iwata, Tetsuya, 4,514,776, Cl. 360-121.000.
Murata, Taneo, 4,514,608, Cl. 200-153.00J.
Noji, Tasuku; and Tobita, Katsumi, 4,514,757, Cl. 358-86.000.

Alsthom-Atlantique: *See*—
Pham Van, Doan, 4,514,605, Cl. 200-148.00A.

Alteepping, Josef; and Bornemann, Dietrich E., to Standard Oil Company (Indiana). Laminate suitable as sealing liner for liquid containers. 4,514,463, Cl. 428-286.000.

AM International, Inc.: *See*—
Westdale, Virgil W.; Hanrahan, James L.; and Anderson, William C., 4,514,077, Cl. 355-3.0DD.

Ameen, Joseph G.; Hogrogian, Richard H.; and Smey, Samuel L., to International Business Machines Corporation. Process for stripping silicon oil base thermal grease. 4,514,232, Cl. 134-1.000.

Amend, William E., to Union Oil Company of California. Geothermal valve. 4,513,947, Cl. 251-174.000.

American Colloid Company: *See*—
Alexander, William, 4,514,510, Cl. 501-148.000.

American Dental Association Health Foundation: *See*—
Bowen, Rafael L., 4,514,527, Cl. 523-115.000.

American District Telegraph Company: *See*—
Guscott, John K., 4,514,631, Cl. 250-342.000.

American Gaming Industries, Inc.: *See*—
Samsel, J. Edward, Jr., 4,513,969, Cl. 273-149.00R.

American Locker Security Systems, Inc.: *See*—
Stackhouse, Wells F., 4,513,851, Cl. 194-51.000.

American Magnetics Corporation: *See*—
Baus, Rene; and Schmidt, Fred W., 4,514,623, Cl. 235-482.000.

American Microsystems, Incorporated: *See*—
Batra, Tarsaim, 4,513,494, Cl. 29-576.00B.

American Optical Corporation: *See*—
Winthrop, John T., 4,514,061, Cl. 351-169.000.

American Roller Company: *See*—
Brands, George B.; and Hyllberg, Bruce E., 4,513,660, Cl. 101-1.000.

American Standard Inc.: *See*—
Nikolayczik, Hans, 4,513,781, Cl. 137-625.410.

Amerosa Enterprises, Inc.: *See*—
Lo, Ching P., 4,513,848, Cl. 192-18.00R.

Amin, Rajendra K.: *See*—
Cook, William T.; Cristinacce, Michael; and Amin, Rajendra K., 4,514,236, Cl. 148-38.000.

Amit, Haim. Two-stage electric water heater. 4,514,617, Cl. 219-314.000.

Amoils, Selig P. Surgical instruments and methods particularly adapted for intra-ocular cutting and the like. 4,513,745, Cl. 128-305.000.

AMP Incorporated: *See*—
Lawrence, George J., 4,514,032, Cl. 339-278.00C.

Ampex Corporation: *See*—
Gallo, Luigi C., 4,514,769, Cl. 358-310.000.
Louth, Kenneth, 4,514,671, Cl. 318-603.000.
O'Gwynn, David C., 4,514,672, Cl. 318-616.000.

AMSTED Industries Incorporated: *See*—
Parshall, David G., 4,514,301, Cl. 210-400.000.

Amtmann, Heribert, to Siemens Aktiengesellschaft. Diagnostic radiology system for angiographic x-ray examinations. 4,514,759, Cl. 358-111.000.

Anami, Koretake: *See*—
Tashiro, Chiaki; Kawakita, Takeshi; Horii, Ichiro; and Anami, Koretake, 4,514,403, Cl. 514-274.000.

Anderberg, Thomas E.: *See*—
Spencer, William H.; and Anderberg, Thomas E., 4,514,799, Cl. 364-200.000.

Anders, Christian; and Beiersdorfer, Roland. Liquid pulsation dampener device. 4,514,151, Cl. 417-540.000.

Anderson, Alan; and Spector, George, to Anderson, Alan. Zodiac designer jeans. 4,513,454, Cl. 2-246.000.

Anderson, C. Roger: *See*—
Kogen, James; and Anderson, C. Roger, 4,514,836, Cl. 369-74.000.

Anderson, Nils A., to Honeywell Information Systems Inc. Computerized system and method of material control. 4,514,815, Cl. 364-478.000.

Anderson, Paul R.: *See*—
Robson, George E.; and Anderson, Paul R., 4,513,962, Cl. 272-68.000.

Anderson, Richard N., to Hunter Douglas Inc. Venetian blind hanger pivot assembly including a hanger pivot member having a slat engaging surface. 4,513,804, Cl. 160-174.000.

Anderson, William C.: *See*—
Westdale, Virgil W.; Hanrahan, James L.; and Anderson, William C., 4,514,077, Cl. 355-3.0DD.

Andersson, Karl F.; and Eriksson, Bolik A. G., to Aktiebolaget Electrolux. Method and arrangement for maintaining a frost-free freezer. 4,513,579, Cl. 62-176.200.

Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, to Hitachi, Ltd.; and Hitachi Microcumputer Engineering Ltd. Semiconductor integrated circuit device including a protective resistor arrangement for output transistors. 4,514,646, Cl. 307-200.00B.

Ando, Yoshio: *See*—
Tanaka, Kano; Ando, Yoshio; and Yanagawa, Hitoshi, 4,514,641, Cl. 250-570.000.

Andreasen, Knud. Reflector system for securing to a light source. 4,514,793, Cl. 362-306.000.

Andrews, Henry L., to Austenal International, Inc. Nonprecious dental alloy. 4,514,359, Cl. 420-436.000.

Angehrn, Jorg A.: *See*—
Johnson, Wade M., Jr.; and Angehrn, Jorg A., 4,514,809, Cl. 364-422.000.

Angeli, Giovanni T.: *See*—
Lange, Gerhard; and Angeli, Giovanni T., 4,513,924, Cl. 242-67.200.

Anger, Klaus: *See*—
Lischke, Burkhard; Frosien, Juergen; Anger, Klaus; and Plies, Erich, 4,514,638, Cl. 250-492.200.

Aoki, Akio, to Trion Corporation. Baseball catching means. 4,513,450, Cl. 2-19.000.

Aoki, Kozo: *See*—
Seto, Nobuo; Kamio, Takayoshi; and Aoki, Kozo, 4,514,490, Cl. 430-505.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,513,638, Cl. 74-866.000.

Aoyagi, Shoji: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.

Aoyama, Yutaka: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,513,835, Cl. 180-142.000.

Appel, Marvin: *See*—
Blumenthal, Jack L.; Ogren, John R.; Rutkowski, Eugene V.; and Appel, Marvin, 4,514,698, Cl. 330-4.300.

Appels, Johannes A.: *See*—
van Ommen, Alfred H.; Maas, Henricus G. R.; Appels, Johannes A.; and Josquin, Wilhelmus J. M. J., 4,514,251, Cl. 156-628.000.

Applied Power Inc.: *See*—
Stephens, Robert; and Clark, Raymond, 4,513,845, Cl. 188-299.000.

APV International Limited: *See*—
Davy, Philip A., 4,513,770, Cl. 137-315.000.

Arai, Naoto: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.

Arai, Tohru: *See*—
Shimada, Hisashi; Arai, Tohru; and Endo, Junji, 4,514,275, Cl. 204-298.000.

Arakawa, Miyao: *See*—
Takenaka, Akihiko; Arakawa, Miyao; Sato, Masahiro; and Yamaguchi, Toshiyuki, 4,513,609, Cl. 73-116.000.

Aranyi, Ernie; Ihasz, Richard; Gravener, Roy D.; and Tovey, Hugh J., to United States Surgical Corp. Instrument for applying plastic-like surgical fastening devices. 4,513,746, Cl. 128-334.00C.

Archer, Farley J. Motorcycle with outrigger wheels. 4,513,837, Cl. 180-209.000.

Arena, Aldo, to Grumman Aerospace Corporation. Method of fabricating a torque joint. 4,513,488, Cl. 29-516.000.

Arikawa, Junichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,513,958, Cl. 271-187.000.

Aritomi, Mitsutoshi: *See*—
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,514,445, Cl. 427-410.000.

Armbruster, Joseph M. Filter for air circulator. 4,514,197, Cl. 55-316.000.

Armco, Inc.: *See*—
Goudy, William E., deceased, 4,513,869, Cl. 212-175.000.

Arnegger, Richard E. Saw blade with aperture. 4,513,742, Cl. 128-317.000.

Aronson, Michael P.: *See*—
Kulkarni, Ravi D.; Goddard, E. Desmond; and Aronson, Michael P., 4,514,319, Cl. 252-321.000.

Arvey Corporation: *See*—
Hirsch, Arthur, 4,514,361, Cl. 422-26.000.

Asahi Glass Company Ltd.: *See*—
Baba, Morimitsu, 4,513,893, Cl. 222-281.000.
Gunjima, Tomoki; and Takei, Ryutaro, 4,514,044, Cl. 350-350.00R.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Negishi, Kiyoshi; Kawasaki, Masahiro; and Tano, Eiichi, 4,514,075, Cl. 354-446.000.

Asai, Mamoru; Mitani, Tsuneyoshi; and Ookawa, Hiroyuki, to Musashi Engineering Kabushiki Kaisha. Apparatus for selecting the precise number within a batch of paper sheets. 4,514,856, Cl. 377-8.000.

Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, to Agency of Industrial Science & Technology; Nitivy Co., Ltd.; and Seimi Chemical Co., Ltd. Method for separating rare earth metals. 4,514,367, Cl. 423-21.500.

Aschermann, Kurt. Baseball bat instruction accessory unit. 4,513,965, Cl. 273-26.00R.

ASEA Aktiebolag: *See*—
Adolfsson, Morgan; Brogardh, Iorgny; Hok, Bertil; and Ovren, Christer, 4,514,860, Cl. 455-612.000.

Ashida, Akira, to Hitachi, Ltd. Discrimination circuit for received data. 4,514,854, Cl. 375-94.000.

Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, to Mitsubishi Chemical Industries, Limited. Process for preparing smoke-retardant polyisocyanurate foam. 4,514,525, Cl. 521-112.000.

Aso, Tomio: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,514,740, Cl. 346-139.00R.

Astech, Inc.: *See*—
Brown, William M.; and Lindquist, James R., 4,514,594, Cl. 179-2.510.

AT&T Bell Laboratories: *See*—
Ahuja, Sudhir R., 4,514,728, Cl. 340-825.500.
Albanese, Andres, 4,514,843, Cl. 370-93.000.
Bean, John C.; Kastalsky, Alexander; and Luryi, Sergey, 4,514,748, Cl. 357-58.000.
Blank, Stuart L.; and Gordon, Eugene I., 4,514,756, Cl. 358-66.000.
Hwang, James C., 4,514,250, Cl. 156-610.000.
Shoji, Masakazu, 4,514,647, Cl. 307-269.000.
Shoji, Masakazu, 4,514,749, Cl. 357-68.000.
Starr, Thomas J. J., 4,514,845, Cl. 371-15.000.

AT&T Technologies, Inc.: *See*—
Fegley, Charles R.; and Tamashasky, Joseph A., 4,513,852, Cl. 198-399.000.
Fletcher, Ivan M.; and Gladish, Gary W., 4,513,855, Cl. 198-473.000.
Gladish, Gary W., 4,514,130, Cl. 414-416.000.
Kent, William C., 4,513,498, Cl. 29-845.000.
Moerschel, Kenneth G., 4,514,436, Cl. 427-10.000.
Seidel, Roland H., 4,514,027, Cl. 339-105.000.

AT&T Teletype Corporation: *See*—
LaSpesa, Richard E., 4,514,100, Cl. 400-55.000.

Atkin, John; and Loustau, Marie-Therese, to Societe Anonyme Dite: SAFT. Method of manufacturing an electrode for an electrochemical cell, and an electrode manufactured by the method. 4,514,473, Cl. 429-10.000.

Atlantic Richfield Company: *See*—
Baillie, Lloyd A., 4,513,603, Cl. 73-37.000.
Dean, Barry D., 4,514,543, Cl. 525-205.000.
Kesling, Haven S., Jr., 4,514,576, Cl. 568-659.000.

Atomic Energy of Canada Limited: *See*—
Symons, Edward A.; Rolston, John H.; Clermont, Michel J.; and Paterson, Linda M., 4,514,377, Cl. 423-648.00A.

Atzet, Jon E. Anti-dieseling device for demand carburetors. 4,513,706, Cl. 123-198.00D.

Audeh, Costandi A., to Mobil Oil Corporation. Process for recovering uranium from spent shale. 4,514,378, Cl. 423-18.000.

August, Melvin C.: *See*—
Williams, John T.; and August, Melvin C., 4,514,784, Cl. 361-386.000.

Augustin, Hubert; and Pirker, Robert, to Voest-Alpine Aktiengesellschaft. Frog, in particular frog point, for rail crossing or rail switches as well as process for producing same. 4,514,235, Cl. 148-37.000.

Auld, Fredreck H.: *See*—
Merrell, Richard G.; and Auld, Fredreck H., 4,514,761, Cl. 358-122.000.

Austenal International, Inc.: *See*—
Andrews, Henry L., 4,514,359, Cl. 420-436.000.

Australasian Training Aids (PTY.) Limited: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.

Autoipari Kutato es Fejleszto Vallalat: *See*—
Cser, Gyula, 4,513,699, Cl. 123-52.0MB.

Automation Industries, Inc.: *See*—
Clark, Thomas A., 4,514,024, Cl. 339-40.000.

Avco Corporation: *See*—
Rosenthal, Dan G.; and Fiedler, Louis J., 4,514,470, Cl. 428-662.000.

Awane, Katunobu: *See*—
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katunobu, 4,514,042, Cl. 350-331.00R.

Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; and Shiokawa, Kozo, to Nihon Tokushu Noyaku Seizo K.K. Herbicidally active methyl-substituted tetrahydro-2-pyrimidinone derivatives. 4,514,210, Cl. 71-92.000.

Aycock, Robert F.: *See*—
Justice, Bruce H.; and Aycock, Robert F., 4,514,440, Cl. 427-85.000.

Ayroldi, Giuseppe. Apparatus for the recovery of oils or other similar pollutants floating on bodies of water, including the open seas. 4,514,299, Cl. 210-242.300.

Azgapetian, Alice M., executrix: *See*—
Azgapetian, Victor, deceased, 4,514,056, Cl. 350-372.000.

Azgapetian, Victor, deceased (by Azgapetian, Alice M., executrix), to United States of America, Air Force. Acoustically tuned optical filter system. 4,514,056, Cl. 350-372.000.

B. F. Goodrich Company, The: *See*—
Heimovics, John F., Jr., 4,513,881, Cl. 222-54.000.
Kugelman, Michael M., 4,514,619, Cl. 219-483.000.
Sarver, Glen E.; and Worstell, Bernard W., 4,513,768, Cl. 137-142.000.

Baba, Morimitsu, to Asahi Glass Company Ltd.; and Baba Seisakusho Co., Ltd. Apparatus for spreading a polyurethane foamable composition. 4,513,893, Cl. 222-281.000.

Baba Seisakusho Co., Ltd.: *See*—
Baba, Morimitsu, 4,513,893, Cl. 222-281.000.

Babcock & Wilcox Company, The: *See*—
Braun, Minel J., 4,513,733, Cl. 126-435.000.
Feldstein, Joel G.; and Gutzwiller, James E., Jr., 4,513,903, Cl. 228-107.000.
Finch, Curtis L., 4,513,497, Cl. 29-727.000.

Badaut, Roger: *See*—
Pere, Gerard; and Badaut, Roger, 4,513,630, Cl. 74-60.000.

Bader, Edgar; Rohrbach, Gerd; Petersen, Jurgen; and Kittel, Ludwig, to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH. Data transmission systems for full duplex communication. 4,514,840, Cl. 370-29.000.

Bagnell, Michael J.; and Ivy, William R. Radiation shielding structures. 4,514,640, Cl. 250-517.100.

Baillie, Lloyd A., to Atlantic Richfield Company. System for measuring crush properties of a catalyst. 4,513,603, Cl. 73-37.000.

Baird, Thomas E., Sr.: *See*—
Ford, Roger S.; Shie, Herman J., III; and Baird, Thomas E., Sr., 4,514,199, Cl. 55-337.000.

Bajulaz, Roger. Method for the transformation of thermal energy into mechanical energy by means of a combustion engine as well as this new engine. 4,513,568, Cl. 60-39.600.

Baker Oil Tools, Inc.: *See*—
Weinberg, Roger A., 4,513,817, Cl. 166-138.000.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Digital television receiver with time-multiplexed analog-to-digital converter. 4,514,760, Cl. 358-143.000.

Balcke-Durr Aktiengesellschaft: *See*—
Ruscheweyh, Hans, 4,514,344, Cl. 261-159.000.

Baldwin, David L. Maze and flexible wand game apparatus. 4,513,971, Cl. 273-153.00R.

Balinski, Ryszard; and Sokulski, Marek, to Osrodek Badawczo-Rozwojowy Aparatury Mleczarskiej. Container for activation of microbiophysical properties of substances especially food-stuffs. 4,513,658, Cl. 99-485.000.

Balzer, David J.; Dennison, Thomas M.; Getz, Marvin G.; and Oestmann, Eldon D., to Caterpillar Tractor Co. Integral idler track adjusting and recoil apparatus. 4,514,014, Cl. 305-10.000.

Bandtel, Eberhard: *See*—
Immel, Otto; Schwarz, Hans-Helmut; Quast, Hein; and Bandtel, Eberhard, 4,514,578, Cl. 568-853.000.

Banter, C. Bruce: *See*—
Adams, George W.; and Banter, C. Bruce, 4,514,105, Cl. 403-24.000.

Baram, Martin. Cartridge for chemicals. 4,513,861, Cl. 206-219.000.

Baran, John S.: *See*—
Hansen, Donald W., Jr.; Baran, John S.; and Owens, William H., 4,514,332, Cl. 260-112.50E.

Baranski, Jan A.: *See*—
Sigvardt, Niels H.; and Baranski, Jan A., 4,513,956, Cl. 271-9.000.

Barber, Gerald L.; and Comstock, Wayne P. Undulating amusement ride apparatus. 4,513,960, Cl. 272-44.000.

Barber, James C., to James C. Barber and Associates, Inc. Production of fluid fertilizer from phosphorus furnace waste stream. 4,514,366, Cl. 423-318.000.

Barlow, Anthony: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,535, Cl. 524-109.000.
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,536, Cl. 524-261.000.

Barnabeo, Austin E., to Union Carbide Corporation. Water curable, azide sulfonyl silane modified, alkylene-alkyl acrylate copolymers. 4,514,545, Cl. 525-330.400.

Barnes, John F.: *See*—
Root, Jon C.; Barnes, John F.; and Coovert, Jack E., 4,514,312, Cl. 252-32.500.

Baroni, Bruno, to SASIB S.p.A. Control device for regulating the feeding of cut tobacco to a cigarette making machine. 4,513,755, Cl. 131-84.00C.

Barrett, Harrison H., to United States of America, Health and Human Services. Modular scintillation camera. 4,514,632, Cl. 250-368.000.

Barrett, John S.: *See*—
Nigol, Olaf; and Barrett, John S., 4,514,237, Cl. 148-142.000.

Barry, David J. Hollow core door and method for making. 4,513,553, Cl. 52-456.000.

Bartell, Frederick O. Blackbody simulator with uniform emissivity. 4,514,639, Cl. 250-493.100.

Bartels, James I., to Honeywell Inc. Fuel burner control system with low fire hole. 4,513,909, Cl. 236-26.00R.

Bartels, James I., to Honeywell Inc. Adaptive low fire hold control system. 4,513,910, Cl. 236-26.00R.

Bartlett, Robert W., to SRI International. Particulate silicon photovoltaic device and method of making. 4,514,580, Cl. 136-250.000.

Barton, David M.: *See*—
Stark, Glenn; and Barton, David M., 4,514,771, Cl. 360-73.000.

BASF Aktiengesellschaft: *See*—
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,514,572, Cl. 549-246.000.
Leoffler, Hermann, 4,514,226, Cl. 106-23.000.
Marx, Matthias; Ganss, Helmut; and Frank, Wolfram, 4,514,526, Cl. 521-166.000.
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.

Bashirov, Zaur A.: *See*—
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., 4,513,620, Cl. 73-664.000.

Bashirova, Alfia G.: *See*—
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., 4,513,620, Cl. 73-664.000.

Bastian, Donald G.: *See*—
Punater, Dinesh G.; and Bastian, Donald G., 4,514,819, Cl. 364-556.000.

Batcheler, Jerry H.; and Marek, Raymond G. Domestic automatic continuously monitoring soil moisture monitor/indicator. 4,514,722, Cl. 340-604.000.

Batchelor, William H.: *See*—
Lagano, Thomas; and Batchelor, William H., 4,513,727, Cl. 123-525.000.

Bates Printing Specialties, Inc.: *See*—
Brown, Lyman J., 4,513,993, Cl. 283-103.000.

Bates, Stanley I.: *See*—
Inoue, Kimio; Hoyer, Gale G.; and Bates, Stanley I., 4,514,574, Cl. 564-424.000.

Batni, Prahlada R. Commutatorless direct current machine. 4,514,653, Cl. 310-178.000.

Batra, Tarsaim, to American Microsystems, Incorporated. Late mask process for programming read only memories. 4,513,494, Cl. 29-576.00B.

Bauer, Dennis P.: *See*—
Lee, John Y.; and Bauer, Dennis P., 4,514,575, Cl. 568-17.000.

Baumann, Marcus: *See*—
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,514,415, Cl. 514-470.000.

Baumert, Kenneth L.; Sagues, Alberto A.; Davis, Burtron H.; and Schweighardt, Frank K., to International Coal Refining Company. Corrosion inhibition for distillation apparatus. 4,514,281, Cl. 208-47.000.

Baumgartner, Hans: *See*—
Sudbeck, Rainer; and Baumgartner, Hans, 4,514,153, Cl. 418-69.000.

Baus, Rene; and Schmidt, Fred W., to American Magnetics Corporation. Automatic teller machine with entrance adapted to prevent access by foreign objects. 4,514,623, Cl. 235-482.000.

Baxter Corporation, The: *See*—
Bowen, John C., Jr., deceased; and Bowen, Wiley C., executrix, 4,513,789, Cl. 139-85.000.

Baxter Travenol Laboratories, Inc.: *See*—
Miller, Carl; and Hogan, Lawrence R., 4,513,796, Cl. 141-83.000.

Bayer Aktiengesellschaft: *See*—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,514,402, Cl. 514-250.000.
Immel, Otto; Schwarz, Hans-Helmut; Quast, Hein; and Bandtel, Eberhard, 4,514,578, Cl. 568-853.000.
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,514,409, Cl. 514-383.000.
Kuhle, Engelbert; Hagemann, Hermann; Paul, Volker; and Brandes, Wilhelm, 4,514,417, Cl. 514-482.000.
Michna, Martin; and Henk, Hermann, 4,514,188, Cl. 8-641.000.
Resz, Raoul; Alberts, Heinrich; Burgdorfer, Hans-Heribert; and El Sayed, Aziz, 4,514,546, Cl. 525-57.000.

Bayless, John H., Jr.: *See*—
LeStrange, Raymond J.; Bayless, John H., Jr.; and Schoenberg, Allan R., 4,514,492, Cl. 430-600.000.

Baylor College of Medicine: *See*—
Kit, Malon; and Kit, Saul, 4,514,497, Cl. 435-235.000.

BBC Brown, Boveri & Company, Limited: *See*—
Jenny, Ernst; Mayer, Andreas; and Moser, Peter, 4,513,571, Cl. 60-603.000.

Bean, John C.; Kastalsky, Alexander; and Luryi, Sergey, to AT&T Bell Laboratories. Germanium p-i-n photodetector on silicon substrate. 4,514,748, Cl. 357-58.000.

Beard, Walter C. Recloasble valve with removable hermetic external seal means. 4,513,889, Cl. 222-153.000.

Becker, John E.: *See*—
Rose, Douglas N.; and Becker, John E., 4,513,807, Cl. 165-10.000.

Becker, Jurgen: *See*—
Kaspar, Klaus P.; Becker, Jurgen; and Huber, Marion, 4,514,091, Cl. 366-130.000.

Beckman Instruments, Inc.: *See*—
Kaye, Wilbur I., 4,514,085, Cl. 356-71.000.

Becton, Dickinson and Company: *See*—
Johnson, Michael D., 4,514,460, Cl. 428-245.000.

Beduchaud, Michel; and Playe, Patrice, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Indirect electrostatic printer. 4,514,078, Cl. 355-3.0BE.

Beers, Melvin D.; and Thompson, James E., to Loctite Corporation. Oil resistant low modulus silicone sealant composition. 4,514,529, Cl. 523-200.000.

Beever, William H.; Shue, Robert S.; and Childers, Clifford W., to Phillips Petroleum Company. Encapsulated electronic components and encapsulation compositions. 4,514,588, Cl. 174-52.0PE.

Begin, John D., to GTE Valeron Corporation. Worn tool detector utilizing normalized vibration signals. 4,514,797, Cl. 364-148.000.

Behringer, Wolfgang, to Siemens Aktiengesellschaft. Apparatus supporting a plurality of dental instruments. 4,514,172, Cl. 433-126.000.

Beiersdorfer, Roland: *See*—
Anders, Christian; and Beiersdorfer, Roland, 4,514,151, Cl. 417-540.000.

Beitinger, Eberhard: *See*—
Nussbaumer, Manfred; Beitinger, Eberhard; and Mohlenbrink, Wolfgang, 4,513,504, Cl. 33-1.00H.

Belgard, Richard A.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Bell & Howell Company: *See*—
Grant, Frederic F., 4,514,055, Cl. 350-6.300.
Spencer, William H.; and Anderberg, Thomas E., 4,514,799, Cl. 364-200.000.
Stites, David G., 4,514,050, Cl. 350-444.000.

Bellamy, Brad L.: *See*—
Dykstra, Jerald P.; and Bellamy, Brad L., 4,514,637, Cl. 250-492.200.

Bendix Automation Company: *See*—
Laskowski, Edward L., 4,513,507, Cl. 33-169.00R.

Benitez, Francisco M.: *See*—
Hughes, Vincent L.; and Benitez, Francisco M., 4,514,554, Cl. 526-339.000.

Bennett, Richard J.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.

Bennett, Simon D.: *See*—
Kino, Gordon S.; Bennett, Simon D.; and Husson, Didier, 4,513,749, Cl. 128-660.000.

Benson, John A.: *See*—
Berry, Paul S.; Benson, John A.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,513,689, Cl. 119-82.000.

Bentley, Gustavus A.; Nash, Stephen E.; and Pichler, Gerald P., to Federal-Mogul Corporation. Rotating-lip grease seal. 4,513,976, Cl. 277-25.000.

Berg, Lloyd. Separation of benzene from non-aromatic hydrocarbons by extractive distillation. 4,514,262, Cl. 203-51.000.

Bergandi Manufacturing Co., Inc.: *See*—
Rohrbacher, Herbert E., 4,513,793, Cl. 140-92.400.

Berger, Paul L.: *See*—
Berger, Richard C.; and Berger, Paul L., 4,513,939, Cl. 248-544.000.

Berger, Richard C.; and Berger, Paul L. Vibration absorption mounting for a rooftop air handling unit. 4,513,939, Cl. 248-544.000.

Berman, James. Teller machine enclosure. 4,513,670, Cl. 109-24.100.

Berman, William A.: *See*—
Wilger, John F.; Nakano, Gregory; and Berman, William A., 4,513,542, Cl. 51-241.00S.

Bernstein, David H.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Bernstein, Pierre: *See*—
Gueugnon, Catherine; and Bernstein, Pierre, 4,514,082, Cl. 355-54.000.

Berry, Paul S.; Benson, John A.; Kettlewell, Peter J.; and Turner, Michael J. B., to National Research Development Corporation. Poultry-harvesting assembly. 4,513,689, Cl. 119-82.000.

Bert, Georges: *See*—
Nuzillat, Gerard; and Bert, Georges, 4,514,649, Cl. 307-450.000.

Berthel, Robert O.; Plank, Vernon G.; Jones, Stephen H.; and Matthews, Anthony J., to United States of America, Air Force. Fall velocity indicator/viewer. 4,514,758, Cl. 358-93.000.

Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, to J A E G E R. Apparatus for monitoring the level of liquid by resistive wire. 4,513,616, Cl. 73-295.000.

Bhagat, Haresh G.: *See*—
Damani, Nalinkant C.; Bhagat, Haresh G.; and McElhaney, Ramon L., 4,514,385, Cl. 424-81.000.

Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., to Union Special Corporation. Mechanism generating elliptical motion. 4,513,674, Cl. 112-220.000.

Bhattacharya, Somnath, to International Business Machines Corporation. Compressively stresses titanium metallurgy for contacting passivated semiconductor devices. 4,514,751, Cl. 357-71.000.

Biehl, Philip D.: *See*—
Loskorn, Richard A.; Biehl, Philip D.; and Catiller, Robert D., 4,514,824, Cl. 364-900.000.

Billington, Richard W.; Blackwell, Gordon B.; and Prodger, Terence E., to Dentsply Limited. Polyethylenically unsaturated monophosphates. 4,514,342, Cl. 260-952.000.

Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, to United States of America, Army. Method of making a porous carbon cathode, a porous carbon cathode so made, and electrochemical cell including the porous carbon cathode. 4,514,478, Cl. 429-196.000.

Binder, Rolf; Hanselmann, Daniel; and Schlepfer, Walter, to Rieter Machine Works Limited. Apparatus for opening textile fiber bales. 4,513,479, Cl. 19-80.00R.

Binks Manufacturing Company: *See*—
Smith, David H., 4,513,913, Cl. 239-119.000.

Binnie, Kevin D., to K. D. Binnie Engineering Pty. Ltd. Seaming machine for mufflers. 4,513,487, Cl. 29-243.500.

Biond Inc.: *See*—
Hirschfeld, Steven, 4,514,508, Cl. 436-518.000.

Birx, Linda B., to Emerson Electric Co. Thermal cutoff construction, member therefor and methods of making the same. 4,514,718, Cl. 337-407.000.

Bischoff, Albrecht: *See*—
Aldinger, Fritz; Bischoff, Albrecht; Keilberth, Richard; and Sperner, Franz, 4,514,589, Cl. 174-119.00R.

Bishop, Harry L., Jr.: *See*—
Tommaney, Joseph W.; and Bishop, Harry L., Jr., 4,514,220, Cl. 75-60.000.

Bishop, Timothy E.; Stanton, Joseph J.; Pasternack, George; and Cutler, Orvid R., Jr., to DeSoto, Inc. Ultraviolet curable outer coatings for optical fiber. 4,514,037, Cl. 350-96.230.

Bisquolm, Werner; Burki, Jorg; and Teuscher, Othmar, to Graf & Cie AG. Card clothing for carding flats. 4,513,480, Cl. 19-113.000.

Biziere, Kathleen: *See*—
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,514,397, Cl. 514-247.000.

Bjornberg, Thomas. Method of and apparatus for the heat-treatment of a continuous web. 4,513,516, Cl. 34-41.000.

Black & Decker, Inc.: *See*—
Van Deursen, Gary E., 4,513,761, Cl. 132-41.000.

Blackwell, Gordon B.: *See*—
Billington, Richard W.; Blackwell, Gordon B.; and Prodger, Terence E., 4,514,342, Cl. 260-952.000.

Blank, Stuart L.; and Gordon, Eugene I., to AT&T Bell Laboratories. Single beam color CRT. 4,514,756, Cl. 358-66.000.

Blasko, Michal: *See*—
Rajsigl, Zdenek; Mladek, Milos; Blasko, Michal; and Smatana, Josef, 4,513,566, Cl. 57-406.000.

Blazejczak, Jean: *See*—
Dubreuil, Jean-Pierre; Blazejczak, Jean; and Tramier, Bernard, 4,514,272, Cl. 204-186.000.

Bloom, Stanley, to RCA Corporation. Mesh lens focus mask for a cathode-ray tube. 4,514,658, Cl. 313-402.000.

Blue Circle Industries PLC: *See*—
Inculet, Ion I., 4,514,289, Cl. 209-127.300.

Blumenthal, Jack L.; Ogren, John R.; Rutkowski, Eugene V.; and Appel, Marvin, to TRW Inc. Chemical laser pump including cryogenic and condensing means. 4,514,698, Cl. 330-4.300.

Board of Regents, The University of Texas System, The: *See*—
Kettman, John R.; and Norgard, Michael V., 4,514,498, Cl. 435-240.000.

Bock, Thomas J.: *See*—
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,513,674, Cl. 112-220.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Branched chain saturated ketones, organoleptic uses thereof and process for preparing same. 4,513,757, Cl. 131-276.000.

Boehringer Mannheim GmbH: *See*—
Kaspar, Klaus P.; Becker, Jurgen; and Huber, Marion, 4,514,091, Cl. 366-130.000.

Bohlin, Leif R. Apparatus for measuring the swelling or shrinkage of a specimen in a fluid. 4,513,611, Cl. 73-150.00R.

Bohnenkamp, Heinrich, to SMS Schloemann-Siemag Aktiengesellschaft. Method of rolling wide strip starting material. 4,513,491, Cl. 29-527.700.

Boillot, Jean-Paul: *See*—
Simoneau, Raynald; Pelletier, Jean-Marc; Di Vincenzo, Antonio; and Boillot, Jean-Paul, 4,514,615, Cl. 219-132.000.

Boliden Aktiebolag: *See*—
Petersson, Stig A., 4,514,217, Cl. 75-10.00R.

Bondinell, William E.; Lafferty, John J.; and Zirkle, Charles L., to Smithkline Beckman Corporation. N-Substituted pyrrolidineacetic acids and their esters. 4,514,414, Cl. 514-422.000.

Bonnaud, Pierre L., to Societe d'Etudes de Machines Thermiques, S.E.M.T. Method of recovering energy in a power generator and power generator for carrying out the said method. 4,513,572, Cl. 60-618.000.

Bonney, Glenn E.; and Longsworth, Ralph C., to Air Products and Chemicals, Inc. Bakeable cryopump. 4,514,204, Cl. 62-41.000.

Booth, Donald S., to Donaldson Company, Inc. Self-cleaning air cleaner assembly with rotating filter element and inertial pre-cleaner. 4,514,193, Cl. 55-290.000.

Borden, Inc.: *See*—
Maxwell, John W.; and Vyse, Brian, 4,514,255, Cl. 162-9.000.

Borg, Arthur N.; and Mark, William J., to Zenith Electronics Corporation. Video monitor with automatic switching between RF and baseband video signals. 4,514,764, Cl. 358-181.000.

Borman, August H.; and Koivunen, Erkki A., to General Motors Corporation. Controlled valving for a dual pump system. 4,514,147, Cl. 417-288.000.

Bornemann, Dietrich E.: *See*—
Alteepping, Josef; and Bornemann, Dietrich E., 4,514,463, Cl. 428-286.000.

Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., to Corning Glass Works. Integral photosensitive optical device and method. 4,514,053, Cl. 350-162.200.

Borrman, Bo; Hellman, Erik; Ode, Bengt; and van Santen, Aart, to AB ASEA-ATOM. Fuel assembly. 4,514,358, Cl. 376-362.000.

Boston University, Trustees of: *See*—
Sengupta, Sisir K., 4,514,330, Cl. 260-112.50R.

Bottigheimer, Andreas; Einsele, Karl-Heinz; and Henig, Klaus, to Robert Bosch GmbH. Device for measuring time intervals between a plurality of successive events. 4,514,835, Cl. 368-118.000.

Boueri, Elias T.: *See*—
Daubenmier, John A.; and Boueri, Elias T., 4,514,811, Cl. 364-424.100.

Bournonville, Jean-Paul: *See*—
Travers, Christine; Chan, Trinh D.; Snappe, Roger; and Bournonville, Jean-Paul, 4,514,515, Cl. 502-154.000.

Bourns, Inc.: *See*—
Creasman, Edwin A., 4,513,942, Cl. 249-95.000.

Bouwknegt, Thys: *See*—
Schutz, Hans U.; Raisin, Helmut; and Bouwknegt, Thys, 4,514,187, Cl. 8-531.000.

Boveri, Sergio: *See*—
Nisato, Dino; and Boveri, Sergio, 4,514,408, Cl. 514-212.000.

Bowden, Edgar A.; and Przybyl, Robert V., to Mobil Oil Corporation. Electronic circuit. 4,514,770, Cl. 360-69.000.

Bowen, John C., Jr., deceased; and by Bowen, Wiley C., executrix, to Baxter Corporation, The. Jacquard harness attachment mechanism. 4,513,789, Cl. 139-85.000.

Bowen, Rafael L., to American Dental Association Health Foundation. Method for obtaining strong adhesive bonding of composites to dentin enamel and other substrates. 4,514,527, Cl. 523-115.000.

Bowen, Wiley C., executrix: *See*—
Bowen, John C., Jr., deceased; and Bowen, Wiley C., executrix, 4,513,789, Cl. 139-85.000.

Bowers, Joseph S., Jr., to Eastman Kodak Company. Process for the preparation of 2,2,4-trimethyl-1,2-dihydroquinoline compounds. 4,514,570, Cl. 546-181.000.

Bowles, Robert W.: *See*—
Frantz, Virgil L.; and Bowles, Robert W., 4,513,604, Cl. 73-39.000.

Bowyer, William H.: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.

Boxmeyer, James G. Inflatable structural column. 4,514,447, Cl. 428-36.000.

Boyer, Don S.; and Freeborn, John C., to Honeywell Inc. Automatic teaching apparatus and method. 4,514,176, Cl. 434-224.000.

Boyle, Joseph P.: *See*—
Wairegi, Tom; Boyle, Joseph P.; and Gilbert, John B., 4,514,284, Cl. 208-140.000.

Bozler, Carl O.: *See*—
Fan, John C. C.; and Bozler, Carl O., 4,514,581, Cl. 136-255.000.

Braatz, James A.; McIntire, Kenneth R.; and Princler, Gerald L., to United States of America, Health and Human Services. Method for the identification and purification of human lung tumor-associated antigens (hLTAA) and clinical detection and determination of these antigens. 4,514,506, Cl. 436-518.000.

Brandenburger, Gary H.: *See*—
Heyman, Joseph S.; and Brandenburger, Gary H., 4,513,750, Cl. 128-660.000.

Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, to Bayer Aktiengesellschaft. Mixture of fungicidal agents. 4,514,402, Cl. 514-250.000.

Brandes, Wilhelm: *See*—
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,514,409, Cl. 514-383.000.
Kuhle, Engelbert; Hagemann, Hermann; Paul, Volker; and Brandes, Wilhelm, 4,514,417, Cl. 514-482.000.

Brands, George B.; and Hyllberg, Bruce E., to American Roller Company. Impression roller for limiting charge distribution. 4,513,660, Cl. 101-1.000.

Brasswer, Joseph L.: *See*—
Alperin, Marvin; and Brasswer, Joseph L., 4,513,940, Cl. 248-674.000.

Bratt, Richard G.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Braun AG: *See*—
Majthan, Rudolf; Stuhler, Rolf; Parsonage, Raymond G.; and Packham, Charles C., 4,514,618, Cl. 219-370.000.

Braun, Gunter; Kratt, Alfred; and Schleicher, Rolf, to Robert Bosch GmbH. Apparatus for regulating the idling speed of internal combustion engines. 4,513,711, Cl. 123-339.000.

Braun, Minel J., to Babcock & Wilcox Company, The. Oil field steam production and use. 4,513,733, Cl. 126-435.000.

Braun, Oskar, to Josef Willmes GmbH. Press for the expression of liquid from liquid-containing substances. 4,513,659, Cl. 100-117.000.

Braun, Wolfgang; Konrath, Karl; and Schwarz, Manfred, to Robert Bosch GmbH. Distributor injection pump for internal combustion engines. 4,513,715, Cl. 123-383.000.

Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Electrical tree and water tree resistant compounds and polymer compositions containing the same. 4,514,535, Cl. 524-109.000.

Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Silanes useful as anti-treeing additives. 4,514,536, Cl. 524-261.000.

Braxton, Henry G., Jr.: *See—*
Filbey, Allen H.; Braxton, Henry G., Jr.; and Meltsner, Bernard R., 4,514,577, Cl. 568-744.000.

Breitenstein, Werner: *See—*
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,514,415, Cl. 514-470.000.

Breithaupt, Albert, to Trube & Kings Kommanditgesellschaft. Sheet aluminum fireproof construction element. 4,513,552, Cl. 52-400.000.

Bresson, Clarence R.; and Mark, Harold W. Ore flotation and flotation agents for use therein. 4,514,293, Cl. 209-167.000.

Bridgestone Tire Company Limited: *See—*
Togashi, Minoru; Kato, Kenshiro; and Furuya, Shin-ichi, 4,513,802, Cl. 152-353.00R.

Bridon Limited: *See—*
Walton, John M., 4,514,058, Cl. 350-96.230.

Briefer, Dennis K.: *See—*
Lee, Shih-Ying; and Briefer, Dennis K., 4,513,831, Cl. 177-189.000.

Briones, Robert A.: *See—*
Haskal, Haim M.; and Briones, Robert A., 4,514,047, Cl. 350-394.000.

Bristley, Barbara E. Window shade mounted alarm system. 4,514,725, Cl. 340-691.000.

British Aerospace Public Limited Company: *See—*
Widdall, John A., 4,513,619, Cl. 73-455.000.

British Gas Corporation: *See—*
Reid, Donald J., 4,513,774, Cl. 137-392.000.

British Nuclear Fuels Limited: *See—*
Powell, Stanley, 4,514,110, Cl. 405-104.000.

British Steel Corporation: *See—*
Cook, William T.; Cristinacce, Michael; and Amin, Rajendra K., 4,514,236, Cl. 148-38.000.

Brogardh, Iorgny: *See—*
Adolfsson, Morgan; Brogardh, Iorgny; Hok, Bertil; and Ovren, Christer, 4,514,860, Cl. 455-612.000.

Bron Elektronik AG: *See—*
Haberthur-Heilig, Walter, 4,514,794, Cl. 362-439.000.

Brooker, Lenon G., to Westinghouse Electric Corp. Warp resistant laminates having a core impregnated with a mixture of phenolix resin and alkyl substituted phenol. 4,514,462, Cl. 428-285.000.

Brown, Duane G. Air intake anti-fouling stack. 4,514,201, Cl. 55-385.00B.

Brown, Harvey A.: *See—*
Huffman, William A.; and Brown, Harvey A., 4,514,045, Cl. 350-351.000.

Brown, Lyman J., to Bates Printing Specialties, Inc. Tear open tamper resistant game ticket assembly. 4,513,993, Cl. 283-103.000.

Brown, Michael A. Variable ventilation system for garments. 4,513,451, Cl. 2-69.000.

Brown, Sand T.: *See—*
Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,514,427, Cl. 426-271.000.

Brown, William M.; and Lindquist, James R., to Astech, Inc. Power line carrier telephone extension system for full duplex conferencing between telephones and having telephone call hold capability. 4,514,594, Cl. 179-2.510.

Brown & Williamson Tobacco Corporation: *See—*
Manecke, Kurt A., 4,514,180, Cl. 493-41.000.
Reed, Steven P., 4,514,249, Cl. 156-553.000.

Bruch, Helmut, to Siemens Aktiengesellschaft. Method for manufacturing a waveguide switch including the formation of beads or crimps to align a pair of optical fibers. 4,514,034, Cl. 350-96.200.

Bruker Analytische Messtechnik GmbH: *See—*
Schneider, Lutz; and Guigas, Bruno, 4,514,822, Cl. 364-900.000.

Brusasca, Gianfranco; and Garzulano, Franco, to Rockwell-Rimoldi S.p.A. Stitch interrupting device for sewing machines. 4,513,673, Cl. 112-166.000.

Brusch, Josef: *See—*
Hanni, Manfred; and Brusch, Josef, 4,514,852, Cl. 375-1.000.

Brussee, Richard C.; and Dowd, Robert E., Jr., to Wm. Neundorfer & Co., Inc. Discharge electrode assembly for electrostatic precipitators. 4,514,780, Cl. 361-226.000.

Buchanan, Bob B.: *See—*
Buchanan, Frank L., Jr.; and Buchanan, Bob B., 4,514,362, Cl. 422-99.000.

Buchanan, Frank L., Jr.; and Buchanan, Bob B. Breath specimen mixer. 4,514,362, Cl. 422-99.000.

Buchanan, James D., to Square D Company. Multispeed interlocked push button switch mechanism. 4,514,601, Cl. 200-5.00E.

Buchel, Karl H.: *See—*
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,514,409, Cl. 514-383.000.

Buchner, Norbert, to Robert Bosch GmbH. Container lid with an opener device. 4,513,876, Cl. 220-270.000.

Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, to International Flavors & Fragrances Inc. Mixed seasoning. 4,514,094, Cl. 366-160.000.

Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, to International Flavors & Fragrances Inc. Enhancing the taste of a meat-flavored foodstuff. 4,514,431, Cl. 426-641.000.

Buckley, Arthur B. X-Ray film holder apparatus. 4,514,072, Cl. 354-337.000.

Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, to Dynamit Nobel Aktiengesellschaft. Profile strip, especially for the production of window or door frames. 4,514,449, Cl. 428-76.000.

Buehler Ltd.: *See—*
Doyle, Ralph R.; and Zimmer, Robert E., 4,513,894, Cl. 222-644.000.

Bull, Cyril A., to Metal Box, PLC. Containers. 4,513,872, Cl. 220-74.000.

Bunn, Dorrance P., Jr.: *See—*
Niccum, Phillip K.; and Bunn, Dorrance P., Jr., 4,514,285, Cl. 208-148.000.

Buonomo, Joseph P.: *See—*
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.

Burdett, Joseph W.: *See—*
Poynor, Paul C.; and Burdett, Joseph W., 4,514,282, Cl. 208-56.000.

Burdick, Charles L., to Hercules Incorporated. Froth flotation process. 4,514,292, Cl. 209-167.000.

Burgdorfer, Hans-Heribert: *See—*
Resz, Raoul; Alberts, Heinrich; Burgdorfer, Hans-Heribert; and El Sayed, Aziz, 4,514,546, Cl. 525-57.000.

Burki, Jorg: *See—*
Bisquolm, Werner; Burki, Jorg; and Teuscher, Othmar, 4,513,480, Cl. 19-113.000.

Burks, Gary E.: *See—*
Chezem, Jimmie A.; and Burks, Gary E., 4,514,000, Cl. 292-338.000.

Burlington Industries, Inc.: *See—*
Dillon, Douglas M., 4,513,791, Cl. 139-194.000.
Pritchard, Frederick D.; and Pittard, John E., 4,514,092, Cl. 366-136.000.

Burroughs Corporation: *See—*
Loskorn, Richard A.; Biehl, Philip D.; and Catiller, Robert D., 4,514,824, Cl. 364-900.000.
Ragle, Herbert U.; and DeMoss, Dean, 4,514,778, Cl. 360-133.000.
Rice, Rex, 4,514,023, Cl. 339-17.0CF.
Yum, Daniel, 4,514,650, Cl. 307-466.000.

Burton, Thomas M.; and Kucharska, Helena Z., to Fiberglas Canada Inc. Method of producing polyester foams using borohydride dispersions. 4,514,523, Cl. 521-85.000.

Bussey, Harry, Jr. Apparatus for making billowed filling elements for packaging. 4,514,165, Cl. 425-311.000.

Bussey, Harry, Jr. Loose fill packing element of hooked configuration. 4,514,453, Cl. 428-159.000.

Bussian, Alfred E.: *See—*
Richter, Albert P., Jr.; Campsey, Ronald L.; Paap, Hans J.; and Bussian, Alfred E., 4,514,627, Cl. 250-255.000.

Butler, Robert F. High efficiency flat plate solar energy collector. 4,513,734, Cl. 126-439.000.

Byerley, Thomas J.: *See—*
Chappelow, Cecil C., Jr.; and Byerley, Thomas J., 4,513,828, Cl. 173-139.000.

Byron, Stephen J.: *See—*
Hattrich, George A.; and Byron, Stephen J., 4,514,539, Cl. 524-436.000.

C-I-L Inc.: *See—*
Rodriguez, Philip A. B., 4,514,318, Cl. 252-315.300.

Cabi-Akman, Robert, to Nestec, S.A. Continuous transport method and apparatus. 4,513,882, Cl. 222-56.000.

Cade, J. Weldon; and Stein, Stanley I., to United States of America, Army. Apparatus for transporting and articulating an article. 4,514,135, Cl. 414-682.000.

Cagle, J. Douglas: *See—*
Olson, Harold D.; Addison, Charles; and Cagle, J. Douglas, 4,513,476, Cl. 17-44.100.

Cagle's, Inc.: *See—*
Olson, Harold D.; Addison, Charles; and Cagle, J. Douglas, 4,513,476, Cl. 17-44.100.

Calder, Robert E. Point-of-purchase advertising for shopping carts. 4,513,983, Cl. 280-33.99A.

Cambridge Instruments Limited: *See—*
Lawson, Peter J., 4,514,634, Cl. 250-397.000.

Campbell, Henry F., to William H. Rorer, Inc. Cardiotonic 5-heteroaryl-pyridone. 4,514,400, Cl. 514-252.000.

Campbell, James H. Pressure foot for machine tool. 4,514,122, Cl. 409-190.000.

Campbell, Thomas G., to United States of America, National Aeronautics and Space Administration. Aircraft rotor blade with passive tuned tab. 4,514,143, Cl. 416-23.000.

Campbell, Willis R. Solar heat collector. 4,513,731, Cl. 126-432.000.

Campman, Keith S.; and Ernst, William B., to Dow Chemical Company, The. Flow meter and densitometer apparatus and method of operation. 4,513,625, Cl. 73-861.720.

Campsey, Ronald L.: *See—*
Richter, Albert P., Jr.; Campsey, Ronald L.; Paap, Hans J.; and Bussian, Alfred E., 4,514,627, Cl. 250-255.000.

Canadian Patents and Development Limited: *See—*
Szabo, Ervin I., 4,514,227, Cl. 106-38.200.

Canfield, Robert E.; Ehrlich, Paul H.; and Moyle, William R., to Columbia University in the City of New York, The Trustees of. Monoclonal antibody mixtures and use thereof for enhanced sensitivity immunoassays. 4,514,505, Cl. 436-500.000.

Cannella, Vincent D.: *See—*
Izu, Masatsugu; and Cannella, Vincent D., 4,514,583, Cl. 136-259.000.

Cannondale Corporation: *See—*
Graham, David R., 4,513,985, Cl. 280-281.00R.

Canon Kabushiki Kaisha: *See—*
Kawai, Tohru, 4,514,039, Cl. 350-255.000.
Tamura, Yasuyuki, 4,514,081, Cl. 355-14.00R.
Tanaka, Kano; Ando, Yoshio; and Yanagawa, Hitoshi, 4,514,641, Cl. 250-570.000.
Tateoka, Masamichi; and Ogata, Yukihiko, 4,514,626, Cl. 250-235.000.
Ushiyama, Hisayuki; Ochi, Hisayuki; Miyamae, Tatsuo; and Wakamiya, Katsutoshi, 4,514,485, Cl. 430-106.600.

Cantamessa, Lorenzo, to DAMP S.p.A. Damping core articulated joint for mechanical articulated arm systems subject to vibrations. 4,513,954, Cl. 267-141.300.

Cantwell, Gill. Apparatus for reading/writing data on magnetic disc. 4,514,772, Cl. 360-75.000.

Canusa Coating Systems Limited: *See—*
Hansen, Ralph H., 4,514,533, Cl. 524-89.000.

Caprino, Joseph C.: *See—*
Leon, Joseph A., Jr.; and Caprino, Joseph C., 4,514,466, Cl. 428-383.000.

Carl Still G.m.b.H. & Co. KG, Firma: *See—*
Laufhutte, Dieter, 4,514,375, Cl. 423-573.00G.

Carlfors Bruk E Bjorlund & Co.: *See—*
Danieli, Sten H., 4,513,843, Cl. 188-62.000.

Carlsen, W. John; and Melman, Paul, to GTE Laboratories Incorporated. Polarization-insensitive optical switch and multiplexing apparatus. 4,514,046, Cl. 350-385.000.

Carlson, John H.; and Agbay, Anthony J., to Omco Inc. Spring security lock. 4,513,591, Cl. 70-34.000.

Carrera, Jacinto P., to Polaroid Corporation. Thin blade members having magnetic repelling forces therebetween. 4,514,065, Cl. 354-235.100.

Carrier Corporation: *See—*
Jennings, William B.; Shelton, Edward B.; and Hayes, Richmond S., Jr., 4,513,586, Cl. 62-263.000.

Carter Controls, Inc.: *See—*
Topinka, George F., 4,514,148, Cl. 417-403.000.

Caruso, Anthony M. Hand grenade safety device. 4,513,667, Cl. 102-487.000.

Cash, David A.: *See—*
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.

Castagnola, Virginio; Frigerio, Giuliano E.; and Pellicciari, Roberto, to Lehner AG. New derivatives of biliary acids, process for the production thereof and pharmaceutical compositions containing the same. 4,514,393, Cl. 260-397.100.

Castner, John F., Sr.; and Sheps, Martin I. Automatic return variable adjustable wrench. 4,513,642, Cl. 81-53.00R.

Caterpillar Tractor Co.: *See—*
Balzer, David J.; Dennison, Thomas M.; Getz, Marvin G.; and Oestmann, Eldon D., 4,514,014, Cl. 305-10.000.

Catiller, Robert D.: *See—*
Loskorn, Richard A.; Biehl, Philip D.; and Catiller, Robert D., 4,514,824, Cl. 364-900.000.

Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., to Texas Instruments Incorporated. Microcomputer with table-read and table-write instructions. 4,514,801, Cl. 364-200.000.

Cavanaugh, Robert J., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene polymer dispersions. 4,514,537, Cl. 524-265.000.

CBS Inc.: *See—*
Mucaro, Salvatore A.; and Tilbor, Neil, 4,513,966, Cl. 273-68.00B.

Celanese Corporation: *See—*
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, 4,514,553, Cl. 526-323.100.
Gillberg-LaForce, Gunilla E., 4,514,438, Cl. 427-54.100.
Roth, Douglas D.; and Ethridge, Fredrick A., 4,514,350, Cl. 264-176.00F.

Cengel, John A.: *See—*
Cousineau, Thomas J.; and Cengel, John A., 4,514,190, Cl. 44-70.000.

Centrifugal Piston Expander, Inc.: *See—*
Dibrell, Edwin W., 4,513,575, Cl. 62-86.000.
Dibrell, Edwin W.; and Wood, Charles D., 4,513,576, Cl. 62-87.000.

Centronics Data Computer Corp.: *See—*
Spitsbergen, Merlin D., 4,513,898, Cl. 226-44.000.
Wang, Cheng-hua, 4,513,496, Cl. 29-606.000.

Centrum Mechanizacji Gornictwa "Komag" : *See—*
Szczesny, Adolf; Kleinert, Reiner; Jedo, Antoni; and Gutorski, Zygmunt, 4,514,300, Cl. 210-342.000.

Cerenzia, Walter S.: *See—*
Schlesinger, Sheldon I.; Cerenzia, Walter S.; and Wilson, Thomas D., 4,514,354, Cl. 264-324.000.

Cermignani, Justine D.; and Ganz, Frederick M., to Grumman Aerospace Corporation. Array antenna system with low coupling elements. 4,514,734, Cl. 343-708.000.

Chabrier, Gilbert, to Spie-Batignolles; and Coflexip. Method for reinforcing a hollow body made by winding a profiled section. 4,514,245, Cl. 156-161.000.

Chamberlain, Jerry E., to Siemens Medical Laboratories, Inc. Ionization chamber for measuring the profile of a radiation field of electron or X-ray radiation. 4,514,633, Cl. 250-374.000.

Chamberlain, John C.: *See—*
Melissa, Raymond F.; Grummett, Lorne H.; and Chamberlain, John C., 4,513,661, Cl. 101-93.040.

Chambers, Allan K.: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,514,096, Cl. 374-27.000.

Chambers, Pamela A.; and Weinstock, Joseph, to Smithkline Beckman Corporation. Anti-hypertensive use of 1-(4'-branched alkylsulfonylphenyl)-6-chloro-7,8-dihydroxy-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,514,394, Cl. 514-213.000.

Champion International Corporation: *See—*
Cooley, James, 4,514,454, Cl. 428-195.000.
Schillinger, Joseph F., 4,513,863, Cl. 206-264.000.

Chan, Trinh D.: *See—*
Travers, Christine; Chan, Trinh D.; Snappe, Roger; and Bournonville, Jean-Paul, 4,514,515, Cl. 502-154.000.

Chang, Yi M.; and Fenwick, James R. Liquid tank weld cavitation protection. 4,513,906, Cl. 228-184.000.

Chankov, Dyanko V.: *See—*
Tzvetanov, Plamen V.; Chankov, Dyanko V.; Nikolov, Orlin A.; and Ivanov, Alexander L., 4,513,902, Cl. 228-25.000.

Chao, Hu H., to International Business Machines Corporation. Word line decoder and driver circuits for high density semiconductor memory. 4,514,829, Cl. 365-189.000.

Chappelow, Cecil C., Jr.; and Byerley, Thomas J., to Conmaco, Inc. Pile driving cap block cushion assembly. 4,513,828, Cl. 173-139.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Coccoli, Joseph D., 4,514,088, Cl. 356-350.000.

Charruau, Stephane, to Thomson-CSF. Integrated-circuit support device employed in a system for selecting high-reliability integrated circuits. 4,514,786, Cl. 361-413.000.

Chemische Werke Huels, AG: *See—*
Riemer, Heinz; Weiss, Joern-Volker; and Mutzberg, Friedhelm, 4,514,467, Cl. 428-413.000.

Chen, Chin H.: *See—*
Scozzafava, Michael; Chen, Chin H.; Reynolds, George A.; and Perlstein, Jerome H., 4,514,481, Cl. 430-58.000.

Chen, Ching H.: *See—*
Chen, Jiann; J.; and Chen, Ching H., 4,513,453, Cl. 2-150.000.

Chen, Hsing-Yao, to RCA Corporation. Inline electron gun for high resolution color display tube. 4,514,659, Cl. 313-412.000.

Chen, Jiann; J.; and Chen, Ching H. Pre-tied necktie. 4,513,453, Cl. 2-150.000.

Chen, Keith A., to Wisconsin Gas Company. Automatic gas shutoff valve. 4,513,776, Cl. 137-498.000.

Chen, Kun S. Safety receptacle. 4,514,715, Cl. 337-113.000.

Cheng, Tai C.; and McKinley, Bruce A., to Raychem Corporation. Conductive polymers exhibiting PTC characteristics. 4,514,620, Cl. 219-553.000.

Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., to Conversion Systems, Inc. Method of stabilizing organic waste. 4,514,307, Cl. 210-751.000.

Chevron Research Company: *See—*
Hubred, Gale L., 4,514,368, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,514,369, Cl. 423-54.000.

Chezem, Jimmie A.; and Burks, Gary E., to Plateau Products Corporation. Spring biased door stop having a vertically movable tension member. 4,514,000, Cl. 292-338.000.

Chiba, Hiroshi: *See—*
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,513,958, Cl. 271-187.000.

Chikamura, Takao: *See—*
Miyata, Yutaka; Chikamura, Takao; and Fujiwara, Shinji, 4,514,765, Cl. 358-213.000.

Childers, Clifford W.: *See—*
Beever, William H.; Shue, Robert S.; and Childers, Clifford W., 4,514,588, Cl. 174-52.0PE.

Chisso Corporation: *See—*
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,514,513, Cl. 502-112.000.

Chiusolo, Louis L.: *See—*
Shvakhman, Lidia; Agro, Ignatius T.; and Chiusolo, Louis L., 4,514,538, Cl. 524-315.000.

Choe, Eui W.: *See—*
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, 4,514,553, Cl. 526-323.100.

Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., to Garrett Corporation, The. Supercharged diesel engine air inflow control system. 4,513,730, Cl. 123-564.000.

Chugai Denki Kogyo K.K.: *See—*
Shibata, Akira, 4,514,238, Cl. 148-431.000.

Chuzawa, Takaaki: *See—*
Nakano, Kunimitsu; Chuzawa, Takaaki; and Ohmuro, Masaru, 4,514,709, Cl. 335-201.000.

Ciba Geigy Corporation: *See—*
Lauton, Alain; and Koci, Zdenek, 4,514,186, Cl. 8-527.000.
Meyer, Willy; and Fory, Werner, 4,514,212, Cl. 71-93.000.
Schutz, Hans U.; Raisin, Helmut; and Bouwknegt, Thys, 4,514,187, Cl. 8-531.000.
Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, 4,514,415, Cl. 514-470.000.

Cii Honeywell Bull (Societe Anonyme): *See*—
Gueugnon, Catherine; and Bernstein, Pierre, 4,514,082, Cl. 355-54.000.
Clampitt, Richard L.; and Russell, Jeffrey A. Sulfonated asphalt. 4,514,308, Cl. 252-8.50C.
Clancy, Gerald F.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.
Clark, Raymond: *See*—
Stephens, Robert; and Clark, Raymond, 4,513,845, Cl. 188-299.000.
Clark, Thomas A., to Automation Industries, Inc. Shielded electrical connector. 4,514,024, Cl. 339-40.000.
Clarke, Peter J.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.
Clermont, Michel J.: *See*—
Symons, Edward A.; Rolston, John H.; Clermont, Michel J.; and Paterson, Linda M., 4,514,377, Cl. 423-648.00A.
Cliff, John O.; and Edwards, James, to Pittsburgh-Des Moines Corporation. Multi-purpose elevated water storage facilities. 4,513,547, Cl. 52-194.000.
Closmann, Philip J.; Waxman, Monroe H.; and Deeds, Charles T., to Shell Oil Company. Process for separating and converting heavy oil asphaltenes in a field location. 4,514,283, Cl. 208-86.000.
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., to Texas Instruments Incorporated. Magnetic bubble memory sense amplifier having a pulsed current mode of operation. 4,514,828, Cl. 365-8.000.
Clum, Charles E.: *See*—
Murray, William V.; Clum, Charles E.; and Lukenbach, Elvin R., 4,514,383, Cl. 424-59.000.
Coates, J. Randall, to Smith International, Inc. Chip relief for rock bits. 4,513,829, Cl. 175-339.000.
Coates, William J., to Smith Kline & French Laboratories Limited. 5-(4-Nitrophenyl)-2(1H)-pyrazinones. 4,514,568, Cl. 544-408.000.
Cobb, Harold W.: *See*—
Plasschaert, Paul E.; Landheer, Dolf; and Cobb, Harold W., 4,514,781, Cl. 361-230.000.
Coccoli, Joseph D., to Charles Stark Draper Laboratory, Inc., The. Single-coupler guided-wave passive resonant-ring optical-gyro instrument. 4,514,088, Cl. 356-350.000.
Coch, Lester; and Rauch, Kurt, to Waldes Kohinoor, Inc. Method and apparatus for delivery of a powder. 4,514,093, Cl. 366-138.000.
Coe, Everett L., Jr., to Joy Manufacturing Company. Discharge electrode. 4,514,195, Cl. 55-152.000.
Coflexip: *See*—
Chabrier, Gilbert, 4,514,245, Cl. 156-161.000.
Cohen, Paul; and Young, William R., to Harris Corporation. Integrated program counter memory management register and incrementer. 4,514,802, Cl. 364-200.000.
Coherent, Inc.: *See*—
Witte, Kenneth G.; and Johnston, Thomas F., Jr., 4,514,849, Cl. 372-29.000.
Coker, Melvin D.; and Wegner, John W., to Koppl Company Inc. Flange system for pipeline plugging. 4,513,788, Cl. 138-89.000.
Cole, Frank J.; and Hahn, Henry N., to Republic Steel Corporation. Method and apparatus for electroplating. 4,514,266, Cl. 204-28.000.
Cole-Parmer Instrument Company: *See*—
Hogan, Lawrence R., 4,513,885, Cl. 222-95.000.
Colgate-Palmolive Company: *See*—
Gaffar, Abdul; Davis, Calvin B.; and Vasers, Margita L., 4,514,382, Cl. 424-54.000.
Colorado Video, Incorporated: *See*—
Southworth, Glen R.; and Johnson, Bruce P., 4,514,753, Cl. 358-11.000.
Columbia University in the City of New York, The Trustees of: *See*—
Canfield, Robert E.; Ehrlich, Paul H.; and Moyle, William R., 4,514,505, Cl. 436-500.000.
Colussi, John J.: *See*—
Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., 4,514,307, Cl. 210-751.000.
Combustion Engineering, Inc.: *See*—
Johnson, Charles B., 4,513,840, Cl. 181-210.000.
Sodergren, Jan H.; and Hales, James W., 4,513,786, Cl. 138-89.000.
Commissariat a l'Energie Atomique: *See*—
Frehaut, Joel; and Roche, Michel, 4,514,628, Cl. 250-299.000.
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,514,371, Cl. 423-449.000.
Compagnie Generale des Etablissements Michelin: *See*—
Mioche, Robert, 4,513,648, Cl. 83-871.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Beduchaud, Michel; and Playe, Patrice, 4,514,078, Cl. 355-3.0BE.
Compagnie Internationale Pour L'Informatique Cii/Honeywell Bull (Societe Anonyme): *See*—
Pon, Francois; Voirin, Jean-Philippe; and Lucan, Andre, 4,514,484, Cl. 430-106.600.
Comstock, Wayne P.: *See*—
Barber, Gerald L.; and Comstock, Wayne P., 4,513,960, Cl. 272-44.000.
Concistori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, to Celanese Corporation. Thermoset resin produced from anisotropic heat-curable acrylic-terminated monomers. 4,514,553, Cl. 526-323.100.
Condrac, Edward J., to Elliott Turbomachinery Co., Inc. Parallel valve rotary machine control system. 4,514,643, Cl. 290-40.00C.
Conley, Richard W.: *See*—
Owoc, James R.; Thomas, John H.; and Conley, Richard W., 4,513,779, Cl. 137-556.000.
Conmaco, Inc.: *See*—
Chappelow, Cecil C., Jr.; and Byerley, Thomas J., 4,513,828, Cl. 173-139.000.
Conoca Inc.: *See*—
Poynor, Paul C.; and Burdett, Joseph W., 4,514,282, Cl. 208-56.000.
Conrad, Richard A. Electromagnetic actuator. 4,514,710, Cl. 335-230.000.
Contartese, Giulio; and Dietz, Joachim, to Thomson-CSF; and Moog S.A.R.L. Electrohydraulic servovalve device. 4,513,782, Cl. 137-625.630.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Reese, Thorsten, 4,513,803, Cl. 152-427.000.
Conversion Systems, Inc.: *See*—
Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., 4,514,307, Cl. 210-751.000.
Cook, Norman, to Lever Brothers Company. Inserts for squeeze bottles. 4,513,914, Cl. 239-121.000.
Cook, William T.; Cristinacce, Michael; and Amin, Rajendra K., to British Steel Corporation. Method of manufacturing an article of non-magnetic austenitic alloy steel for a drill collar. 4,514,236, Cl. 148-38.000.
Cooley, James, to Champion International Corporation. Heat dissipating decorative laminate. 4,514,454, Cl. 428-195.000.
Cooper, Donald C. Combined refrigeration and heating circuits. 4,513,580, Cl. 62-183.000.
Coovert, Jack E.: *See*—
Root, Jon C.; Barnes, John F.; and Coovert, Jack E., 4,514,312, Cl. 252-32.500.
Copal Company Limited: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,514,064, Cl. 354-234.100.
Corning Glass Works: *See*—
Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,514,053, Cl. 350-162.200.
Covington, Arthur K.; and Sibbald, Alastair, 4,514,276, Cl. 204-415.000.
Darcangelo, Charles M.; Montierth, Max R.; and Ni, Yang-Chou M., 4,514,205, Cl. 65-12.000.
DeAngelis, Thomas P., 4,514,268, Cl. 204-67.000.
Noll, Lee A., 4,514,499, Cl. 435-240.000.
Cornnuts Hybrids, Inc.: *See*—
Muirhead, Robert C., Jr.; and Shaver, Donald L., 4,513,532, Cl. 47-58.000.
Costabile, John J. Method and apparatus for producing a bulge in thin metal material. 4,513,598, Cl. 72-62.000.
Cotone, Giancarlo: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Cottis, Robert A.: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.
Coupal, John. Analytical filtration technique. 4,513,607, Cl. 73-61.400.
Courbat-Chavanne, Bernard: *See*—
Henzelin, Bernard; and Courbat-Chavanne, Bernard, 4,513,758, Cl. 131-291.000.
Courtney, Thomas F., Jr.: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,514,429, Cl. 426-535.000.
Cousineau, Thomas J.; and Cengel, John A., to Standard Oil Company (Indiana). Synthetic fuel composition. 4,514,190, Cl. 44-70.000.
Covington, Arthur K.; and Sibbald, Alastair, to Corning Glass Works. Microelectronic sensor assembly. 4,514,276, Cl. 204-415.000.
Cramer, Barry G.; and Cramer, Roy A., to Air-O-Lator Corporation. Aspirating horizontal mixer. 4,514,343, Cl. 261-37.000.
Cramer, Roy A.: *See*—
Cramer, Barry G.; and Cramer, Roy A., 4,514,343, Cl. 261-37.000.
Cray Research, Inc.: *See*—
Williams, John T.; and August, Melvin C., 4,514,784, Cl. 361-386.000.
Creasman, Edwin A., to Bourns, Inc. Plate molding apparatus with interlocking cavity plates. 4,513,942, Cl. 249-95.000.
Crepeau, Allen E., to Uniroyal, Inc. Method of protecting a roof. 4,514,442, Cl. 427-140.000.
Creusot-Loire: *See*—
Pere, Gerard; and Badaut, Roger, 4,513,630, Cl. 74-60.000.
Cristinacce, Michael: *See*—
Cook, William T.; Cristinacce, Michael; and Amin, Rajendra K., 4,514,236, Cl. 148-38.000.
Crook, Edward J., Jr., to Crosby Group, Inc., The. Wire rope to chain connector for anchoring systems. 4,513,681, Cl. 114-293.000.
Crosby Group, Inc., The: *See*—
Crook, Edward J., Jr., 4,513,681, Cl. 114-293.000.
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, to FMC Corporation; and Kanagawa Chemical Laboratory, Ltd. Nematicidal use of hydrazinecarboxamides and carbothioamides. 4,514,419, Cl. 514-521.000.

Crum, Glen F., to El Paso Products Company. Refining of tertiary butylstyrene. 4,514,261, Cl. 203-9.000.

Cser, Gyula, to Autoipari Kutato es Fejleszto Vallalat. Intake gas resonance system for internal combustion engines. 4,513,699, Cl. 123-52.0MB.

Culling, Michael J.; and Deefholts, Benedict M. M., to Gunson's Sortex Limited. Sorting machine. 4,513,868, Cl. 209-581.000.

Cuming, Kenneth J. Moisture sensing and control device. 4,513,608, Cl. 73-73.000.

Cummings, Robert, to U.S. Clinical Products, Inc. Method of making a flexible sterile closure system for containers. 4,514,248, Cl. 156-268.000.

Curry, John J. Dispensing cap. 4,513,888, Cl. 222-153.000.

Curtis, Douglas R. Variable filter circuit. 4,514,704, Cl. 330-305.000.

Curtis Instruments: *See*—
Finger, Eugene P., 4,514,694, Cl. 324-429.000.

Cushman, Barry M.: *See*—
Deal, Samuel B.; and Cushman, Barry M., 4,514,456, Cl. 428-204.000.

Cutler, Orvid R., Jr.: *See*—
Bishop, Timothy E.; Stanton, Joseph J.; Pasternack, George; and Cutler, Orvid R., Jr., 4,514,037, Cl. 350-96.230.

Cutts, William H.; and Seydel, Scott O. Method for splitting textile warp yarn sheets. 4,513,485, Cl. 28-181.000.

Cvacho, Daniel S. Methods of necking-in and flanging tubular can bodies. 4,513,595, Cl. 72-43.000.

Cycles Peugeot: *See*—
Herbulot, Alain, 4,513,601, Cl. 72-398.000.

Czajkowski, Norman. Golf cart. 4,513,989, Cl. 280-645.000.

D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy: *See*—
el Din Nasser, Gamal, 4,514,260, Cl. 202-270.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kubota, Yasuo; Tanaka, Kazuhiko; and Kikushima, Kazuyuki, 4,514,767, Cl. 358-280.000.

Dai Nippon Toryo Co., Ltd.: *See*—
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,514,445, Cl. 427-410.000.

Daidotokushuko Kabushikikaisha: *See*—
Inagaki, Etsuo, 4,514,218, Cl. 75-12.000.

Daimler-Benz Aktiengesellschaft: *See*—
Sternberg, Rudolf; and Schnapper, Martin, 4,513,701, Cl. 123-188.0AA.

Daiwa Seiko Co., Ltd.: *See*—
Yamaguchi, Nobuyuki, 4,513,925, Cl. 242-84.50A.

Dale, Jim E., to United States of America, Agriculture. Rope wick applicator. 4,513,528, Cl. 47-1.500.

Daly, Jeffery E., to Reed Rock Bit Company. Friction bearing assembly having a series of rings constituting a bushing therefor. 4,514,097, Cl. 384-93.000.

Damani, Nalinkant C.; Bhagat, Haresh G.; and McElhaney, Ramon L., to Alcon Laboratories, Inc. Anti-acne compositions. 4,514,385, Cl. 424-81.000.

DAMP S.p.A.: *See*—
Cantamessa, Lorenzo, 4,513,954, Cl. 267-141.300.

Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, to Robert Bosch GmbH. Combination sparkplug and combustion process sensor. 4,514,656, Cl. 313-11.500.

Dan T. Moore Co.: *See*—
Moore, Dan T., III; and Fischer, Michael F., 4,514,243, Cl. 156-113.000.

Dana Corporation: *See*—
Swoveland, Jack E., 4,513,632, Cl. 74-484.00R.

Danfoss A/S: *See*—
Kuckelhahn, Kjeld, 4,514,678, Cl. 318-807.000.

Danieli, Sten H., to Carlfors Bruk E Bjorlund & Co. Railway car retarder for shunting purposes. 4,513,843, Cl. 188-62.000.

Dany, Franz-Josef: *See*—
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,514,328, Cl. 252-609.000.

Darcangelo, Charles M.; Montierth, Max R.; and Ni, Yang-Chou M., to Corning Glass Works. Fiber cooling apparatus. 4,514,205, Cl. 65-12.000.

Darves-Bornoz, Yves; Melvin, George E.; Ryan, Michael G.; and Saylor, Dennis L., to International Business Machines Corporation. Particle detection system. 4,513,613, Cl. 73-159.000.

Data General Corporation: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Daubenmier, John A.; and Boueri, Elias T., to Ford Motor Company. Forward drive release system for automatic transmission. 4,514,811, Cl. 364-424.100.

Daubon, Charles E. Level clamp apparatus. 4,513,955, Cl. 269-41.000.

Davi, Horace: *See*—
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,514,397, Cl. 514-247.000.

Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., to Federal Cartridge Corporation. Shotshell casing with partially telescoped basewad. 4,514,352, Cl. 264-230.000.

Davidsmeyer, Walter F. Injection nozzle with direct electric heating. 4,514,160, Cl. 425-143.000.

Davies, Robert B.: *See*—
Dotson, Robert N.; Davies, Robert B.; and Miller, Ira, 4,514,648, Cl. 307-350.000.

Davis, Burton I.: *See*—
Spurling, Robert A.; Davis, Burton I.; and Taylor, Norman G., 4,513,537, Cl. 51-71.000.

Davis, Burtron H.: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; Davis, Burtron H.; and Schweighardt, Frank K., 4,514,281, Cl. 208-47.000.

Davis, Calvin B.: *See*—
Gaffar, Abdul; Davis, Calvin B.; and Vasers, Margita L., 4,514,382, Cl. 424-54.000.

Davis, Edward L.; and Mowatt-Larssen, Erling, to General American Transportation Corporation. Tank with selectively variable automatic outage. 4,513,795, Cl. 141-35.000.

Davis, Roland O., to Santa Barbara Research Center. Low friction pivot. 4,514,016, Cl. 308-2.00A.

Davy, Philip A., to APV International Limited. Flow control valve. 4,513,770, Cl. 137-315.000.

Dayus, Lloyd G. Damper and blade therefor. 4,513,655, Cl. 98-121.200.

Deal, Samuel B.; and Cushman, Barry M., to RCA Corporation. Method of making a coded marking in a glass workpiece employing a trisilicate coating and product thereof. 4,514,456, Cl. 428-204.000.

Dean, Barry D., to Atlantic Richfield Company. Methylmethacrylate/-phenylmaleimide copolymer and styrene/maleic anhydride copolymer. 4,514,543, Cl. 525-205.000.

Dean, Raymond H.: *See*—
Humphreys, Norman G.; and Dean, Raymond H., 4,513,574, Cl. 62-59.000.

DeAngelis, Thomas P., to Corning Glass Works. Electrolytic Al production with reaction sintered cermet component. 4,514,268, Cl. 204-67.000.

Deeds, Charles T.: *See*—
Closmann, Philip J.; Waxman, Monroe H.; and Deeds, Charles T., 4,514,283, Cl. 208-86.000.

Deefholts, Benedict M. M.: *See*—
Culling, Michael J.; and Deefholts, Benedict M. M., 4,513,868, Cl. 209-581.000.

DeGraaff, Robert; and Langeiri, Michael. Ride-on toy vehicle with front wheel drive and outboard front wheels. 4,513,981, Cl. 280-1.11R.

Degussa Aktiengesellschaft: *See*—
Kerner, Dieter; Kleinschmit, Peter; Parkhouse, Alan; and Wolff, Siegfried, 4,514,231, Cl. 106-309.000.

Deibert, Richard L.; and Mikeal, Gary L. Tamper indicating and theft preventing electrical meter. 4,514,683, Cl. 324-110.000.

Deisenroth, Werner: *See*—
Starp, Franz; and Deisenroth, Werner, 4,514,066, Cl. 354-273.000.

De Jong, Walter J. Method and apparatus for feeding livestock. 4,513,687, Cl. 119-27.000.

Delepine, Jean C. Flow spout for liquid. 4,513,458, Cl. 4-192.000.

De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., to Southwest Research Institute. Baggage inspection apparatus and method for determining presences of explosives. 4,514,691, Cl. 324-301.000.

Demi, Roy C. Apparatus adaptable for treating animals. 4,513,741, Cl. 128-205.250.

Demko, David J. Pigeon cage assembly. 4,513,686, Cl. 119-15.600.

DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,514,778, Cl. 360-133.000.

Denholm, William T.; Floyd, John M.; Errington, William J.; and Parry, Anthony N., to Mount Isa Mines Limited. High intensity lead smelting process. 4,514,222, Cl. 75-77.000.

Dennison, Thomas M.: *See*—
Balzer, David J.; Dennison, Thomas M.; Getz, Marvin G.; and Oestmann, Eldon D., 4,514,014, Cl. 305-10.000.

Dentsply Limited: *See*—
Billington, Richard W.; Blackwell, Gordon B.; and Prodger, Terence E., 4,514,342, Cl. 260-952.000.

Dentsply Research & Development Corp.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.

de Saint Martin, Lucien, to Institut de Recherches de la Siderurgie Francaise. Method of producing molten metal. 4,514,219, Cl. 75-43.000.

DeSoto, Inc.: *See*—
Bishop, Timothy E.; Stanton, Joseph J.; Pasternack, George; and Cutler, Orvid R., Jr., 4,514,037, Cl. 350-96.230.
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., 4,514,552, Cl. 526-301.000.

Deutsch, Leslie J.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,513,651, Cl. 84-1.220.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Generation of anharmonic overtones in a musical instrument by additive synthesis. 4,513,651, Cl. 84-1.220.

Deutsche Solvay Werke GmbH: *See*—
Kaeufer, Helmut; Rautenberg, Lutz; and Pahl, Joachim, 4,514,351, Cl. 264-210.200.

Deveau, Paul J.; Greenberg, Paul B.; and Paolillo, Roger E., to United Technologies Corporation. Gas turbine engine active clearance control. 4,513,567, Cl. 60-39.020.

Develle, Guy; and Martin, Gerard, to Sofiltra Poelman. Apparatus for pressurization and filtration of contaminated air. 4,514,198, Cl. 55-337.000.

Devuyst, Eric A.; and Ettel, Victor A., to INCO Limited. Process of producing cobalt-containing solutions and salts. 4,514,372, Cl. 423-493.000.

Dhabhar, Dadi J.; and Schmidt, Nicholas F., to Richardson-Vicks Inc. Hydrophilic denture adhesive. 4,514,528, Cl. 523-120.000.

Dhainaut, Alain: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,398, Cl. 514-245.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,399, Cl. 514-241.000.

Diafloc Co., Ltd.: *See*—
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, 4,514,551, Cl. 526-233.000.

Diamond, Craig J.: *See*—
Tegeler, John J.; and Diamond, Craig J., 4,514,410, Cl. 514-221.000.

Diamond Shamrock Chemicals Company: *See*—
Papalos, John G.; and Sinka, Joseph V., 4,514,189, Cl. 44-51.000.

Dias, Francisco J.: *See*—
Luhleich, Hartmut; and Dias, Francisco J., 4,514,346, Cl. 264-29.500.

Dibrell, Edwin W., to Centrifugal Piston Expander, Inc. Centrifugal piston expander. 4,513,575, Cl. 62-86.000.

Dibrell, Edwin W.; and Wood, Charles D., to Centrifugal Piston Expander, Inc. Gas pressure operated power source. 4,513,576, Cl. 62-87.000.

Diesel Kiki Company, Ltd.: *See*—
Nakamura, Teruo; and Fukuda, Shoichi, 4,514,157, Cl. 418-259.000.

Dietz, Joachim: *See*—
Contartese, Giulio; and Dietz, Joachim, 4,513,782, Cl. 137-625.630.

Dillon, Douglas M., to Burlington Industries, Inc. Leno selvaging and stretch nozzle system. 4,513,791, Cl. 139-194.000.

DiNardo, Victor M., to United States Steel Corporation. Modified polypropylene for film. 4,514,534, Cl. 524-108.000.

DiSanzo, Carmine P.: *See*—
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, 4,514,419, Cl. 514-521.000.

Display Interface Corporation: *See*—
Whetstone, Albert L.; Shaklee, Kerry L.; and Modjallal, Khosrow, 4,514,726, Cl. 340-710.000.

Di Vincenzo, Antonio: *See*—
Simoneau, Raynald; Pelletier, Jean-Marc; Di Vincenzo, Antonio; and Boillot, Jean-Paul, 4,514,615, Cl. 219-132.000.

Doherty, John, Jr., to Texas Instruments Incorporated. Single terminal snap acting thermal switch. 4,514,717, Cl. 337-365.000.

Dolenc, Anton; and Rollenitz, Leopold, to Steyr-Daimler-Puch Aktiengesellschaft. Method of adjusting a plurality of fuel injection units associated with respective cylinders of a multi-cylinder diesel engine. 4,513,714, Cl. 123-357.000.

Domain, Inc.: *See*—
Rebhan, Herbert J., 4,514,425, Cl. 426-93.000.

Dominion Engineering Works Limited: *See*—
Harris, Thomas E., 4,513,599, Cl. 72-238.000.

Domtar Inc.: *See*—
Grignon, Jacques, 4,514,448, Cl. 428-68.000.

Donaldson Company, Inc.: *See*—
Booth, Donald S., 4,514,193, Cl. 55-290.000.

Donat Flamanc Inc.: *See*—
Giguere, Jean-Paul, 4,513,536, Cl. 49-470.000.

Donzis, Byron A. Shock absorbing athletic equipment. 4,513,449, Cl. 2-2.000.

Dotson, Robert N.; Davies, Robert B.; and Miller, Ira, to Motorola, Inc. Current sense circuit for a bubble memory voltage booster. 4,514,648, Cl. 307-350.000.

Dotson, Ronald L.: *See*—
Woodard, Kenneth E., Jr.; and Dotson, Ronald L., 4,513,904, Cl. 228-116.000.

Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., to Dentsply Research & Development Corp. Methods for posterior dental restoration employing light curable packable compositions. 4,514,174, Cl. 433-226.000.

Doughty, Elexsis D., to Procter & Gamble Company, The. Bleach cake in an improved bleach resistant particle retaining means. 4,513,459, Cl. 4-222.000.

Dover, Donald L.; and Leitch, William J., to Robbins & Myers, Inc. Ceiling fan and outlet box support. 4,513,994, Cl. 248-544.000.

Dow Chemical Company, The: *See*—
Campman, Keith S.; and Ernst, William B., 4,513,625, Cl. 73-861.720.
Henslee, Walter W.; and Foster, Stephen I., 4,514,518, Cl. 502-229.000.
Hunter, Douglas L., 4,514,380, Cl. 423-417.000.
Inoue, Kimio; Hoyer, Gale G.; and Bates, Stanley I., 4,514,574, Cl. 564-424.000.

Dowd, Robert E., Jr.: *See*—
Brussee, Richard C.; and Dowd, Robert E., Jr., 4,514,780, Cl. 361-226.000.

Dowzall, Martin E.; and Houssian, Vazgen J., to Esselte Pendaflex Corporation. Layout boards. 4,513,511, Cl. 33-447.000.

Doyle, Ralph R.; and Zimmer, Robert E., to Buehler Ltd. Abrasive slurry supply system for use in metallographic sample preparation. 4,513,894, Cl. 222-644.000.

Draiswerke GmbH: *See*—
Durr, Herbert, 4,514,833, Cl. 366-207.000.

Dravnieks, Konstantins: *See*—
Schneider, Steven L.; and Dravnieks, Konstantins, 4,513,809, Cl. 165-54.000.

Dresser Industries, Inc.: *See*—
Ippolito, Rodolfo M., 4,514,098, Cl. 384-95.000.
Johnson, Wade M., Jr.; and Angehrn, Jorg A., 4,514,809, Cl. 364-422.000.
Kleeb, Thomas R.; and Kleeb, Linda L., 4,514,531, Cl. 524-5.000.

Dricot, Jean-Marie, to Mirodan, Ets. Louis D'Haene & Sons. Cutting vitrous sheet corners. 4,513,649, Cl. 83-883.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal aryl N-(alkylthio-phosphorothio)acyl-N-alkylcarbamates. 4,514,392, Cl. 514-148.000.

Dual Filtrex, Inc.: *See*—
Fine, Max, 4,513,590, Cl. 68-18.00C.

Dubiel, Oswald, to Wagner, Paul-Heinz. Rotary tool. 4,513,827, Cl. 173-12.000.

Dubreuil, Jean-Pierre; Blazejczak, Jean; and Tramier, Bernard, to Societe Nationale Elf Aquitaine (Production). Process and device for breaking stabilized emulsions, especially oil-water emulsions. 4,514,272, Cl. 204-186.000.

Dubrin, James W., to United States of America, Energy. Method for isotope enrichment by photoinduced chemiionization. 4,514,363, Cl. 423-3.000.

Dufour, Jacques. Automatic machine for coiling down cable. 4,513,922, Cl. 242-54.00R.

Duhault, Jacques: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,398, Cl. 514-245.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,399, Cl. 514-241.000.

Duncan Electric Company, Inc.: *See*—
Mayfield, Glenn A., 4,514,686, Cl. 324-142.000.

Dunn, Charles S., to Owens-Corning Fiberglas Corporation. Arc circuit electrodes for arc glass-melting furnace. 4,514,851, Cl. 373-27.000.

Dupin, Thierry: *See*—
Jacques, Roland; and Dupin, Thierry, 4,514,511, Cl. 502-8.000.

Du Pont de Nemours, E. I., and Company: *See*—
Cavansugh, Robert J., 4,514,537, Cl. 524-265.000.
Eckelt, Peter; and Taylor, James A., Jr., 4,513,647, Cl. 83-203.000.
Frances, Arnold, 4,514,541, Cl. 524-514.000.
Hwang, Sang-Hak, 4,514,455, Cl. 428-198.000.
LeStrange, Raymond J.; Bayless, John H., Jr.; and Schoenberg, Allan R., 4,514,492, Cl. 430-600.000.
Rorer, Morris P., 4,514,211, Cl. 71-92.000.
Rorer, Morris P., 4,514,214, Cl. 71-93.000.
Siuta, Vincent P., 4,514,321, Cl. 252-512.000.
Swoboda, Thomas J., 4,514,322, Cl. 252-518.000.
Zimmerman, William T., 4,514,213, Cl. 71-93.000.

Durr, Herbert, to Draiswerke GmbH. Dispersing machine with container holding device. 4,514,833, Cl. 366-207.000.

Duval Corporation: *See*—
Long, Wallace H.; and Ruggiero, Ralph, 4,513,859, Cl. 198-842.000.

Du Vernet, Richard B., to Westvaco Corporation. C_{21}-Dicarboxylic acid isethionates as primary anionic surfactants. 4,514,335, Cl. 260-400.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Herbst, Thomas, 4,513,556, Cl. 52-698.000.
Schambeck, Herbert, 4,513,465, Cl. 14-17.000.

Dydyk, Michael; and Iwer, Herbert W., to Motorola, Inc. Dielectric resonator controlled planar IMPATT diode oscillator. 4,514,707, Cl. 331-107.0SL.

Dykstra, Jerald P.; and Bellamy, Brad L., to Eaton Corporation. Atomic mass measurement system. 4,514,637, Cl. 250-492.200.

Dynamit Nobel Aktiengesellschaft: *See*—
Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, 4,514,449, Cl. 428-76.000.

Dzewaltowski, Victor F.; and Hobbs, Robert N., to Ex-Cell-O Corporation. Grinding machine with CNC pivotable workhead. 4,513,540, Cl. 51-165.710.

Dzewaltowski, Victor F.: *See*—
Millay, Lawrence I.; and Dzewaltowski, Victor F., 4,513,541, Cl. 51-237.00R.

E.M.B. Corporation: *See*—
Staples, Paul R., 4,514,603, Cl. 200-61.620.

E. R. Squibb & Sons, Inc.: *See*—
Gordon, Eric M.; Godfrey, Jollie D., Jr.; and Natarajan, Sesha I., 4,514,391, Cl. 514-2.000.

Eagle Precision Tool Ltd.: *See*—
Usher, George R., 4,513,596, Cl. 72-51.000.

Eastman Kodak Company: *See*—
Bowers, Joseph S., Jr., 4,514,570, Cl. 546-181.000.
Kindt, Robert J., 4,513,959, Cl. 271-270.000.
Passmore, David T.; and Windibank, Brian P., 4,514,230, Cl. 106-243.000.
Scozzafava, Michael; Chen, Chin H.; Reynolds, George A.; and Perlstein, Jerome H., 4,514,481, Cl. 430-58.000.

Eaton Corporation: *See*—
Dykstra, Jerald P.; and Bellamy, Brad L., 4,514,637, Cl. 250-492.200.
Goscenski, Edward J., Jr., 4,513,633, Cl. 74-650.000.
Kenny, Andrew A., 4,513,785, Cl. 137-881.000.
King, Monroe L., 4,514,636, Cl. 250-443.100.
Treadwell, William A., 4,513,836, Cl. 180-177.000.

Ebihara, Hideyuki: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,513,958, Cl. 271-187.000.
Eckelt, Peter; and Taylor, James A., Jr., to Du Pont de Nemours, E. I., and Company. Portable pneumatic wire cutter. 4,513,647, Cl. 83-203.000.
Eckert, Rolf, to Klockner-Humboldt-Deutz Aktiengesellschaft. Reciprocating piston internal combustion engine. 4,513,703, Cl. 123-193.0CH.
Ecole, Auguste L., to Equipements Automobilies Marchal. End of travel stop device for an electric motor drive mechanism. 4,514,669, Cl. 318-443.000.
Ed. Zublin Aktiengesellschaft: *See*—
Nussbaumer, Manfred; Beitinger, Eberhard; and Mohlenbrink, Wolfgang, 4,513,504, Cl. 33-1.00H.
Eden, George T.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.
Edmonds, David A., to United States of America, Navy. Impact switch for guided projectiles. 4,513,664, Cl. 102-216.000.
Edo, Teruo, to Kabushiki Kaisha Komatsu Seisakusho. Fuel injector. 4,513,719, Cl. 123-447.000.
Edwards, James: *See*—
Cliff, John O.; and Edwards, James, 4,513,547, Cl. 52-194.000.
Edwards, Julian G.; and Roddie, Alan G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Photon drag detectors. 4,514,624, Cl. 250-211.00R.
Eggengoor, Hilbert: *See*—
van Zon, Cornelis; Jonkeren, Gerrit J.; and Eggengoor, Hilbert, 4,514,302, Cl. 210-433.200.
Ehrfeld, Wolfgang; and Krieg, Gunther, to Kernforschungszentrum Karlsruhe GmbH. Motionless mixer. 4,514,095, Cl. 366-340.000.
Ehrler, Arthur J.: *See*—
Roser, Carl A.; and Ehrler, Arthur J., 4,513,563, Cl. 56-295.000.
Ehrlich, Paul H.: *See*—
Canfield, Robert E.; Ehrlich, Paul H.; and Moyle, William R., 4,514,505, Cl. 436-500.000.
Einsele, Karl-Heinz: *See*—
Bottigheimer, Andreas; Einsele, Karl-Heinz; and Henig, Klaus, 4,514,835, Cl. 368-118.000.
Eisai Ci., Ltd.: *See*—
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, 4,514,395, Cl. 514-224.000.
Eisemann, Kurt, to U.S. Philips Corporation. Disc player for a rigid information-carrying disc. 4,514,839, Cl. 369-270.000.
Eko Video Limited: *See*—
Hackett, Joseph, 4,513,928, Cl. 242-198.000.
El Paso Products Company: *See*—
Crum, Glen F., 4,514,261, Cl. 203-9.000.
el Din Nasser, Gamal, to D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy. Apparatus for the desalination of sea water. 4,514,260, Cl. 202-270.000.
Eldridge, Emmojean: *See*—
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., 4,514,552, Cl. 526-301.000.
Electric Power Research Institute, Inc.: *See*—
Gilker, Clyde, 4,514,685, Cl. 324-142.000.
Electricity Council, The: *See*—
Lloyd, Harold; and Slinn, David S. L., 4,514,607, Cl. 200-150.00A.
Eli Lilly and Company: *See*—
Wheeler, William J., 4,514,564, Cl. 544-25.000.
Elliott, David G., to United States of America, National Aeronautics and Space Administration. Method for driving two-phase turbines with enhanced efficiency. 4,514,137, Cl. 415-1.000.
Elliott Turbomachinery Co., Inc.: *See*—
Condrac, Edward J., 4,514,643, Cl. 290-40.00C.
Ellis, J. Scott: *See*—
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,514,029, Cl. 339-143.00R.
El Sayed, Aziz: *See*—
Resz, Raoul; Alberts, Heinrich; Burgdorfer, Hans-Heribert; and El Sayed, Aziz, 4,514,546, Cl. 525-57.000.
Emerson Electric Co.: *See*—
Birx, Linda B., 4,514,718, Cl. 337-407.000.
Wicke, Charles A.; and Riley, Wayne C., 4,513,887, Cl. 222-146.500.
Emhart Industries, Inc.: *See*—
Adams, George W.; and Banter, C. Bruce, 4,514,105, Cl. 403-24.000.
Empie, John E. Golfer's head movement restraining device. 4,513,972, Cl. 273-190.00R.
Endo, Akira; Hasegawa, Akira; and Shibata, Takanori, to Hitachi, Ltd. Power supply system for automotive parts having a rotary component. 4,514,645, Cl. 307-10.00R.
Endo, Hirohide: *See*—
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, 4,514,079, Cl. 355-8.000.
Endo, Junji: *See*—
Shimada, Hisashi; Arai, Tohru; and Endo, Junji, 4,514,275, Cl. 204-298.000.
Energy Conversion Devices, Inc.: *See*—
Hanak, Joseph J., 4,514,579, Cl. 136-249.000.
Izu, Masatsugu; and Cannella, Vincent D., 4,514,583, Cl. 136-259.000.
Nath, Prem; and Izu, Masatsugu, 4,513,684, Cl. 118-718.000.
Nath, Prem, 4,514,437, Cl. 427-39.000.
Engel, Peter A.; Strope, Douglas H.; and Wray, Thomas E., to International Business Machines Corporation. Displacement compensating module. 4,514,752, Cl. 357-72.000.
English Clays Lovering Pochin & Company, Ltd.: *See*—
Wall, George W.; and Jones, Glyn T., 4,514,298, Cl. 210-232.000.
Engman, Bo H. S., to Permobil AB. Wheeled chassis. 4,513,832, Cl. 180-6.500.
Enichimica S.p.A.: *See*—
Romano, Ugo; Rivetti, Franco; and Sasselli, Giacomo, 4,514,339, Cl. 260-453.00P.
Ennerst, Karl: *See*—
Stoll, Wolfgang; and Ennerst, Karl, 4,514,364, Cl. 423-4.000.
Enqvist, Johan R., to Osakeyhtio, A. Ahlstrom. Bioreactor. 4,514,297, Cl. 210-194.000.
Enthone, Inc.: *See*—
Waggoner, John, 4,514,586, Cl. 174-35.0MS.
Enviro-Spray Systems, Inc.: *See*—
Magid, David J., 4,513,884, Cl. 222-94.000.
Equipements Automobilies Marchal: *See*—
Ecole, Auguste L., 4,514,669, Cl. 318-443.000.
Erasmus, Stephen J.: *See*—
Smith, Kenneth C. A.; and Erasmus, Stephen J., 4,514,629, Cl. 250-311.000.
Erickson, Jack A.: *See*—
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,514,352, Cl. 264-230.000.
Eriksson, Bolik A. G.: *See*—
Andersson, Karl F.; and Eriksson, Bolik A. G., 4,513,579, Cl. 62-176.200.
Ernst Leitz Wetzler GmbH: *See*—
Loseries, Peter, 4,514,076, Cl. 354-481.000.
Ernst, William B.: *See*—
Campman, Keith S.; and Ernst, William B., 4,513,625, Cl. 73-861.720.
Errington, William J.: *See*—
Denholm, William T.; Floyd, John M.; Errington, William J.; and Parry, Anthony N., 4,514,222, Cl. 75-77.000.
Escher, Sina D.; and Morris, Anthony F., to Firmenich SA. Utilization of 2-hydroxy-3,4,4-trimethyl-cyclopent-2-en-1-one as perfuming ingredient. 4,514,323, Cl. 252-522.00R.
Ese Limited: *See*—
Lang, Gordon R.; Longstaff, Fred M.; and Lee, Chi H., 4,514,855, Cl. 375-97.000.
Eshland Enterprises, Inc.: *See*—
Eshleman, Roger D., 4,513,671, Cl. 110-101.0CF.
Eshleman, Roger D., to Eshland Enterprises, Inc. Particle fuel delivery control device. 4,513,671, Cl. 110-101.0CF.
Esselte Pendaflex Corporation: *See*—
Dowzall, Martin E.; and Houssian, Vazgen J., 4,513,511, Cl. 33-447.000.
ETA S.A., Fabriques d'Ebauches: *See*—
Grandjean, Remy; and Guerin, Yves, 4,514,676, Cl. 318-696.000.
Ethicon, Inc.: *See*—
Smith, Daniel J., 4,513,747, Cl. 128-339.000.
Ethridge, Fredrick A.: *See*—
Roth, Douglas D.; and Ethridge, Fredrick A., 4,514,350, Cl. 264-176.00F.
Ethyl Corporation: *See*—
Filbey, Allen H.; Braxton, Henry G., Jr.; and Meltsner, Bernard R., 4,514,577, Cl. 568-744.000.
Kirsch, Warren B., 4,514,374, Cl. 423-497.000.
Lee, John Y.; and Bauer, Dennis P., 4,514,575, Cl. 568-17.000.
Penton, Harold R., 4,514,550, Cl. 525-538.000.
Ettel, Victor A.: *See*—
Devuyst, Eric A.; and Ettel, Victor A., 4,514,372, Cl. 423-493.000.
Evans, David G., to General Motors Corporation. Solenoid valve. 4,513,780, Cl. 137-625.650.
Evans, John T., to General Electric Company. Multi-processor axis control. 4,514,814, Cl. 364-474.000.
Evans, John W. Pressurized lubrication assembly for machinery having a flow restrictor device. 4,513,704, Cl. 123-196.00S.
Evans, John W. Pressurized lubrication assembly for the center bearing of a turbocharger. 4,513,705, Cl. 123-196.00S.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., to International Flavors & Fragrances Inc. 1,2,3,3,5,6-Hexamethyl-bicyclo[2.2.2]oct-5-en-2-ol, and organoleptic uses of same. 4,514,324, Cl. 252-522.00R.
Ex-Cell-O Corporation: *See*—
Dzewaltowski, Victor F.; and Hobbs, Robert N., 4,513,540, Cl. 51-165.710.
Lesniak, Thomas A., 4,513,811, Cl. 165-79.000.
Millay, Lawrence I.; and Dzewaltowski, Victor F., 4,513,541, Cl. 51-237.00R.
Exxon Research and Engineering Co.: *See*—
Ho, Teh C.; and Pan, Wie-Hin, 4,514,517, Cl. 502-220.000.
Hughes, Vincent L.; and Benitez, Francisco M., 4,514,554, Cl. 526-339.000.
McMath, Henry G.; and Stenerson, Gary K., 4,514,168, Cl. 432-14.000.
Rossi, Albert, 4,514,314, Cl. 252-56.00D.
Shaw, David H.; and Hall, Ralph R., 4,514,280, Cl. 208-33.000.
Tiedje, Thomas; and Abeles, Benjamin, 4,514,582, Cl. 136-256.000.
Wairegi, Tom; Boyle, Joseph P.; and Gilbert, John B., 4,514,284, Cl. 208-140.000.

Eyelet Specialty Co., Inc.: *See—*
Ackerman, Walter T.; and Klimeck, Edward F., 4,514,102, Cl. 401-78.000.

Falck, John B.; and Robson, David. Coded information arrangement. 4,514,731, Cl. 340-825.080.

Fallon, David E., to Harvey Hubbell Incorporated. Fiber optic cable grip. 4,514,005, Cl. 294-86.420.

Fan, John C. C.; and Bozler, Carl O., to Massachusetts Institute of Technology. Solar cells having ultrathin active layers. 4,514,581, Cl. 136-255.000.

Fanuc Ltd.: *See—*
Matsui, Mitsuo; and Matsumura, Teruyuki, 4,514,611, Cl. 219-69.00M.
Nozawa, Ryoichiro; and Kawamura, Hideaki, 4,514,813, Cl. 364-474.000.

Farber, David A.: *See—*
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Mongelli, Nicola; and Gandolfi, Carmelo, 4,514,396, Cl. 514-222.000.

Farmos Yhtyma Oy: *See—*
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,514,412, Cl. 514-397.000.

Farrand, Robert M.; and Puzio, Daniel, to General Motors Corporation. Check valve assembly. 4,513,784, Cl. 137-854.000.

Farrow, Gerald: *See—*
Conciatori, Anthony B.; Choe, Eui W.; and Farrow, Gerald, 4,514,553, Cl. 526-323.100.

Fassauer, Arthur L. Pelletized material feeder. 4,513,688, Cl. 119-52.00A.

Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joaohim, to Robert Bosch GmbH. Electric positioning motor control system, particularly automatic vehicle antenna extension system. 4,514,670, Cl. 318-467.000.

Fay, Rudolph J. Sandwich machine. 4,513,656, Cl. 99-450.400.

Federal Cartridge Corporation: *See—*
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,514,352, Cl. 264-230.000.

Federal-Mogul Corporation: *See—*
Bentley, Gustavus A.; Nash, Stephen E.; and Pichler, Gerald P., 4,513,976, Cl. 277-25.000.

Federico, Anthony M.; Legg, Ernest L.; and Nguyen, Tuan A., to Xerox Corporation. Control fault detection for machine recovery and diagnostics prior to malfunction. 4,514,846, Cl. 371-16.000.

Fegley, Charles R.; and Tamashasky, Joseph A., to AT&T Technologies, Inc. Orienting asymmetrically shaped articles. 4,513,852, Cl. 198-399.000.

Feldman, Karl T., Jr. Passive integral solar heat collector system. 4,513,732, Cl. 126-433.000.

Feldstein, Joel G.; and Gutzwiller, James E., Jr., to Babcock & Wilcox Company, The. Method of repairing leaks in steam generator tubes. 4,513,903, Cl. 228-107.000.

Fellner, Theodore F.; and Talo, Leslie C., to Mapatent, N.V. Horizontal accumulator. 4,513,858, Cl. 198-812.000.

Fenton, Geoffrey J., to Magnetic Engineering Pty. Ltd. Hinges and hinged articles. 4,513,475, Cl. 16-360.000.

Fenwick, James R.: *See—*
Chang, Yi M.; and Fenwick, James R., 4,513,906, Cl. 228-184.000.

Ferrante, Ronald A., to United States of America, Navy. Method of making near infrared polarizers. 4,514,479, Cl. 430-2.000.

Fesman, Gerald, to Stauffer Chemical Company. Intumescent flexible polyurethane foam. 4,514,524, Cl. 521-107.000.

Feuerbaum, Hans-Peter, to Siemens Aktiengesellschaft. Secondary electron spectrometer for measuring voltages on a sample utilizing an electron probe. 4,514,682, Cl. 324-71.300.

Fiberglas Canada Inc.: *See—*
Burton, Thomas M.; and Kucharska, Helena Z., 4,514,523, Cl. 521-85.000.

Fiedler, Louis J.: *See—*
Rosenthal, Dan G.; and Fiedler, Louis J., 4,514,470, Cl. 428-662.000.

Filbey, Allen H.; Braxton, Henry G., Jr.; and Meltsner, Bernard R., to Ethyl Corporation. Chemical process for preparing di-ortho benzyl phenols. 4,514,577, Cl. 568-744.000.

Filby, John E., to Petro-Canada Exploration, Inc. Azeotropic dehydration process for treating bituminous froth. 4,514,305, Cl. 210-703.000.

Fill, Ernst: *See—*
Witte, Klaus J.; Fill, Ernst; and Scrlac, Walter, 4,514,848, Cl. 372-25.000.

Finch, Curtis L., to Babcock & Wilcox Company, The. Tube expanding system. 4,513,497, Cl. 29-727.000.

Fine, Max, to Dual Filtrex, Inc. Combination filter apparatus for use with a dry cleaning machine. 4,513,590, Cl. 68-18.00C.

Finger, Eugene P., to Curtis Instruments. Quiescent battery testing method and apparatus. 4,514,694, Cl. 324-429.000.

Finley, Charles M.; and Moore, Clifford G., to Rohrback Corporation. Flush electrical resistance corrosion probe. 4,514,681, Cl. 324-65.0CR.

(Firma) Aug. Winkhaus: *See—*
Heiland, Bernd, 4,514,625, Cl. 250-221.000.

Firmenich SA: *See—*
Escher, Sina D.; and Morris, Anthony F., 4,514,323, Cl. 252-522.00R.

Fischer, Michael F.: *See—*
Moore, Dan T., III; and Fischer, Michael F., 4,514,243, Cl. 156-113.000.

Fischer, Walter, to Nestle & Fischer. Angle-measuring instrument having an indicator for the degree of angle. 4,513,512, Cl. 33-471.000.

Fisher, Richard. Automatic hose reel. 4,513,772, Cl. 137-355.220.

Fistner, David C., Sr.: *See—*
McGarry, Phillip E.; Herman, David E.; Treskot, Robert A.; and Fistner, David C., Sr., 4,514,291, Cl. 209-166.000.

Fitzgerald, James L. Instrument for indirect ophthalmoscopy and electrical energy producing means therefor. 4,514,062, Cl. 351-205.000.

Fitzgerald, James L. Instrument for indirect ophthalmoscopy and electrical energy producing means therefor. 4,514,476, Cl. 429-94.000.

Flakt Aktiebolag: *See—*
Herrlander, Bo, 4,514,196, Cl. 55-223.000.
Lundqvist, Gosta B., 4,514,746, Cl. 361-385.000.

Fletcher, Ivan M.; and Gladish, Gary W., to AT&T Technologies, Inc. Substrate elevator mechanisms. 4,513,855, Cl. 198-473.000.

Floyd, John M.: *See—*
Denholm, William T.; Floyd, John M.; Errington, William J.; and Parry, Anthony N., 4,514,222, Cl. 75-77.000.

FMC Corporation: *See—*
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, 4,514,419, Cl. 514-521.000.
Sethi, Dalbir S., 4,514,376, Cl. 423-588.000.

Ford, Donald F. Flexible horseshoe. 4,513,824, Cl. 168-4.000.

Ford Motor Company: *See—*
Daubenmier, John A.; and Boueri, Elias T., 4,514,811, Cl. 364-424.100.
Hayden, William L., 4,513,468, Cl. 15-250.360.
Holubka, Joseph W., 4,514,548, Cl. 525-528.000.
Holubka, Joseph W., 4,514,549, Cl. 525-528.000.
Sagady, Daniel V., 4,514,108, Cl. 403-359.000.
Stace, Richard J. L., 4,513,709, Cl. 123-306.000.

Ford, Roger S.; Shie, Herman J., III; and Baird, Thomas E., Sr., to Scott & Fetzer Company, The. Vacuum cleaner dirt box. 4,514,199, Cl. 55-337.000.

Forrer, Robert E.; and Postier, Robert A., to Gerber Garment Technology, Inc. Method of cutting and labeling sheet material. 4,514,246, Cl. 156-264.000.

Fortuna, Vincent E.: *See—*
MacLaughlin, Donald N.; and Fortuna, Vincent E., 4,514,242, Cl. 156-73.500.

Fory, Werner: *See—*
Meyer, Willy; and Fory, Werner, 4,514,212, Cl. 71-93.000.

Fossi, Mario: *See—*
Manservisi, Renato; and Fossi, Mario, 4,513,908, Cl. 229-87.00C.

Foster, Stephen I.: *See—*
Henslee, Walter W.; and Foster, Stephen I., 4,514,518, Cl. 502-229.000.

Fox, Sidney W.; and Przybylski, Aleksander T., to University of Miami. Organic photovoltaic device. 4,514,584, Cl. 136-263.000.

Foxboro Company, The: *See—*
McHale, Edward J.; Hussain, Yousif A.; Sanderson, Michael L.; and Hemp, John, 4,513,624, Cl. 73-861.120.

Frances, Arnold, to Du Pont de Nemours, E. I., and Company. Fiber containing particulate elastomeric composition. 4,514,541, Cl. 524-514.000.

Frank, Wolfram: *See—*
Marx, Matthias; Ganss, Helmut; and Frank, Wolfram, 4,514,526, Cl. 521-166.000.

Franke, Albrecht: *See—*
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.

Frantz, Virgil L.; and Bowles, Robert W. Method and apparatus for indicating leakage in compressed air line. 4,513,604, Cl. 73-39.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,514,124, Cl. 409-295.000.

Fraser-Reid, Bertram; and Pauls, Heinz W., to Research Corporation. Process for preparing α-L N-acetyl daunosaminide. 4,514,561, Cl. 536-18.700.

Freeborn, John C.: *See—*
Boyer, Don S.; and Freeborn, John C., 4,514,176, Cl. 434-224.000.

Frehaut, Joel; and Roche, Michel, to Commissariat a l'Energie Atomique. Coaxial miniature magnetic spectrometer. 4,514,628, Cl. 250-299.000.

Fresenius AG: *See—*
Mathieu, Bernd; and Polaschegg, Hans-Dietrich, 4,514,295, Cl. 210-90.000.

Fricke, Reinhard L.; Hinze, Klaus; Huth, Manfred K. O.; and Wisskirchen, Klaus B., to ITT Industries, Inc. Pushbutton switch having leaf-shaped contact spring. 4,514,609, Cl. 200-159.00A.

Frickel, Fritz-Frieder: *See—*
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.

Friedheim, Ernst A. H., to Rockefeller University, The. Melaminylthioarsenites. 4,514,390, Cl. 514-184.000.

Friedrich, Ludwig: *See*—
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.
Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, to Windmere Corporation. Apparatus for treating the feet. 4,513,735, Cl. 128-24.200.
Friehe, Werner: *See*—
Niehaus, Norbert; Friehe, Werner; and Schwenk, Wilhelm, 4,513,995, Cl. 285-55.000.
Frigerio, Giuliano E.: *See*—
Castagnola, Virginio; Frigerio, Giuliano E.; and Pellicciari, Roberto, 4,514,393, Cl. 260-397.100.
Frijters, Petrus J. G.; and van Es, Antonie F. Method and device for raising worms, method of raising worms in nutrition limited by inhibiting means, method of producing worm castings, and holder for raising worms. 4,513,685, Cl. 119-1.000.
Frito-Lay, Inc.: *See*—
Glass, Richard W.; and Koerner, Dennis W., 4,514,428, Cl. 426-321.000.
Hartman, Kenneth T., 4,514,430, Cl. 426-549.000.
FRL, Inc.: *See*—
Johnson, David E.; and Williams, Richard W., 4,514,692, Cl. 324-329.000.
Frohberger, Paul-Ernst: *See*—
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,514,409, Cl. 514-383.000.
Frosien, Juergen: *See*—
Lischke, Burkhard; Frosien, Juergen; Anger, Klaus; and Plies, Erich, 4,514,638, Cl. 250-492.200.
Frost, Donald J.: *See*—
Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., 4,514,307, Cl. 210-751.000.
Frye, Samuel M.; and Singleton, James O., to Milliken Research Corporation. Double sidewinder. 4,514,134, Cl. 414-659.000.
Fuchs, Francis J., Jr. Chamfering apparatus. 4,514,121, Cl. 409-138.000.
Fuji Electric Company, Ltd.: *See*—
Yokomori, Shinji; and Nakajima, Yoshihisa, 4,513,762, Cl. 133-3.00R.
Fuji Photo Film Co., Ltd.: *See*—
Hirai, Hiroyuki; Sato, Kozo; and Kawata, Ken, 4,514,493, Cl. 430-617.000.
Idota, Yoshio; and Inoue, Noriyuki, 4,514,488, Cl. 430-234.000.
Oishi, Kengo; and Suzuki, Osamu, 4,513,929, Cl. 242-198.000.
Seto, Nobuo; Kamio, Takayoshi; and Aoki, Kozo, 4,514,490, Cl. 430-505.000.
Tabei, Masatoshi, 4,514,755, Cl. 358-44.000.
Fuji Photo Optical Co., Ltd.: *See*—
Hirano, Nagayoshi, 4,514,049, Cl. 350-425.000.
Fuji Xerox Co., Ltd.: *See*—
Matsuzawa, Kiyoshi; and Inoue, Noriyuki, 4,514,080, Cl. 355-14.00C.
Moriguchi, Haruhiko; and Inui, Toshiharu, 4,514,736, Cl. 346-76.0PH.
Saitoh, Hiroyuki; and Kikuchi, Yoshiki, 4,514,744, Cl. 346-153.100.
Fujii, Hiroshi; and Sakamoto, Toshiharu, to Toyo Kogyo Co., Ltd. Apparatus for charging cooling liquid to engine cooling system. 4,513,696, Cl. 123-41.020.
Fujii, Noboru: *See*—
Shinohara, Satoru; Fujii, Noboru; Imada, Kiyohisa; Kadota, Genichi; and Ueno, Hideo, 4,514,560, Cl. 536-1.100.
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, to Torii & Co. Ltd. Amidine compound, process for producing same and anti-complement agent comprising same. 4,514,416, Cl. 549-442.000.
Fujimoto, Teruo: *See*—
Miyaki, Yoshiyuki; Fujita, Yoshitaka; Se, Kazunori; and Fujimoto, Teruo, 4,514,304, Cl. 210-638.000.
Fujita, Takashi: *See*—
Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, 4,514,451, Cl. 428-141.000.
Fujita, Yoshitaka: *See*—
Miyaki, Yoshiyuki; Fujita, Yoshitaka; Se, Kazunori; and Fujimoto, Teruo, 4,514,304, Cl. 210-638.000.
Sainen, Tsutomu; Sakano, Toshiyuki; Fujita, Yoshitaka; and Imai, Toshiki, 4,513,790, Cl. 139-110.000.
Fujitsu Limited: *See*—
Oritani, Atsushi, 4,514,831, Cl. 365-203.000.
Tateishi, Terutaka; and Shimizu, Kazuyuki, 4,514,847, Cl. 371-51.000.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, to Alps Electric Co., Ltd. Sheet guide mechanism in a recording device. 4,514,740, Cl. 346-139.00R.
Fujiwara, Shinji: *See*—
Miyata, Yutaka; Chikamura, Takao; and Fujiwara, Shinji, 4,514,765, Cl. 358-213.000.
Fujiwara, Yuji: *See*—
Muramatsu, Shigeru; Fujiwara, Yuji; Hayashida, Hazime; and Yamamoto, Jun, 4,513,652, Cl. 84-20.000.
Fujiyama, Seiichi; Minakami, Hiroyuki; and Masai, Hiroshi, to Nakano Vinegar Co., Ltd. Highly viscous polysaccharides. 4,514,563, Cl. 536-123.000.
Fukagawa, Hitoshi: *See*—
Suzuki, Yoshiharu; Fukagawa, Hitoshi; Komoda, Yoshiyuki; and Tanaka, Osamu, 4,514,719, Cl. 340-310.00R.
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Molybdenum board and process of manufacturing the same. 4,514,234, Cl. 148-11.50P.
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, to Nissan Motor Company, Limited. Steering control apparatus. 4,513,835, Cl. 180-142.000.
Fukuda, Osamu: *See*—
Yoshizumi, Hajime; Matsumoto, Nobuya; Fukuda, Osamu; and Fukushi, Osamu, 4,514,496, Cl. 435-162.000.
Fukuda, Shoichi: *See*—
Nakamura, Teruo; and Fukuda, Shoichi, 4,514,157, Cl. 418-259.000.
Fukuoka, Kenji, to Olympus Optical Company Ltd. Distance measuring apparatus. 4,514,083, Cl. 356-1.000.
Fukuroi, Takeo, to Yoshida Kogyo K. K. Fluid-tight slide fastener stringer. 4,513,482, Cl. 24-384.000.
Fukushi, Osamu: *See*—
Yoshizumi, Hajime; Matsumoto, Nobuya; Fukuda, Osamu; and Fukushi, Osamu, 4,514,496, Cl. 435-162.000.
Fuller, Peter W. W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Wear reducing projectile. 4,513,668, Cl. 102-511.000.
Funk, Harald F. System for treating and recovering energy from exhaust gases. 4,513,573, Cl. 60-648.000.
Furukawa, Keiji: *See*—
Mizobuchi, Norihiro; Furukawa, Keiji; and Motoyama, Takeshi, 4,513,581, Cl. 62-197.000.
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, to Nitto Chemical Industry Co., Ltd.; Mitsubishi Rayon Co., Ltd.; and Diafloc Co., Ltd. Process for the preparation of cationic polymers. 4,514,551, Cl. 526-233.000.
Furutani, Toshinobu: *See*—
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, to Hitachi, Ltd. Process for regenerating cleaning fluid. 4,514,270, Cl. 204-151.000.
Furuya, Shin-ichi: *See*—
Togashi, Minoru; Kato, Kenshiro; and Furuya, Shin-ichi, 4,513,802, Cl. 152-353.00R.
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M. Seed and/or fertilizer distributor. 4,514,114, Cl. 406-65.000.
Fuss, Eric W.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,514,114, Cl. 406-65.000.
Fuss, Jarvis R.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,514,114, Cl. 406-65.000.
Fuss, Roy M.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,514,114, Cl. 406-65.000.
G. D. Searle & Co.: *See*—
Hansen, Donald W., Jr.; Baran, John S.; and Owens, William H., 4,514,332, Cl. 260-112.50E.
Gacek, John J. Beverage lid cutter. 4,513,502, Cl. 30-229.000.
GAF Corporation: *See*—
Williams, Earl P.; and Wood, Lindley S., 4,514,271, Cl. 204-159.150.
Gaffar, Abdul; Davis, Calvin B.; and Vasers, Margita L., to Colgate-Palmolive Company. Oral product for controlling gingivitis. 4,514,382, Cl. 424-54.000.
Gage, Clifford H., to Kowalczyk, Annette. Machine for manufacturing tackless strips. 4,513,901, Cl. 227-49.000.
Gal, Uzi, to Uzia R&D Associates. Grip and stock assembly for facilitating use of a compact gun. 4,513,523, Cl. 42-72.000.
Galcenski, Anthony P., Jr.: *See*—
Jalbert, Robert A.; Galcenski, Anthony P., Jr.; and Urmson, Charles C., 4,513,518, Cl. 36-44.000.
Gallas, Gunter A., to Slater Electric, Inc. Apparatus for forming cable entry port. 4,513,492, Cl. 29-564.700.
Gallegos, John C. Twin camera, shoulder carry, rotary, stabilization pod. 4,514,067, Cl. 354-293.000.
Gallina, Damian J. Hemorrhoid treatment method. 4,514,384, Cl. 424-80.000.
Gallo, Luigi C., to Ampex Corporation. Method and apparatus for processing color video signals for recording and reproducing. 4,514,769, Cl. 358-310.000.
Gandolfi, Carmelo: *See*—
Mongelli, Nicola; and Gandolfi, Carmelo, 4,514,396, Cl. 514-222.000.
Ganss, Helmut: *See*—
Marx, Matthias; Ganss, Helmut; and Frank, Wolfram, 4,514,526, Cl. 521-166.000.
Gantz, Jack L.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,513,730, Cl. 123-564.000.
Ganz, Frederick M.: *See*—
Cermignani, Justine D.; and Ganz, Frederick M., 4,514,734, Cl. 343-708.000.
GAO Gesellschaft fur Automation and Organisation mbH: *See*—
May, Stefan; and Muller, Hans, 4,513,992, Cl. 283-94.000.
Garan, Inc.: *See*—
Noto, Peter; and Reid, Michael, 4,514,178, Cl. 434-395.000.

Garbo, Paul W.: *See*—
Valentine, Walter J., 4,514,724, Cl. 340-648.000.
Garcia, Antonio D., to Segutronica, S.A. Electro-mechanical lock. 4,514,001, Cl. 292-341.160.
Garcia, Carlos N.; Rigg, Bryan C.; and Tanner, Sally A., to Motorola, Inc. Photolithography process. 4,514,489, Cl. 430-327.000.
Garlapaty, Venkat R., to Greenco Corporation. Fitting for an inflatable tube. 4,513,997, Cl. 285-242.000.
Garner, Geoffrey M.; and Salloway, Anthony J., to Plessey Overseas Limited. Telephone handsets. 4,514,596, Cl. 179-84.00T.
Garratt, John N.: *See*—
Wise, Thomas J.; and Garratt, John N., 4,514,103, Cl. 138-106.000.
Garrett Corporation, The: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,513,730, Cl. 123-564.000.
Garside, David, to 128980 Canada Inc. Expendable refrigeration control. 4,513,582, Cl. 62-222.000.
Garzulano, Franco: *See*—
Brussaca, Gianfranco; and Garzulano, Franco, 4,513,673, Cl. 112-166.000.
Gas Spring Company, Division of Fichtel & Sachs Industries, Inc.: *See*—
Molders, Werner; Langanke, Rolf; Sentinger, Egon; and Reuschenbach, Hermann, 4,513,953, Cl. 267-121.000.
Gasper, Bertram: *See*—
Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, 4,514,449, Cl. 428-76.000.
Gassler, Hermann; and Kosak, Wolfgang, to Robert Bosch GmbH. Apparatus for regulating the idling rpm in an internal combustion engine. 4,513,712, Cl. 123-339.000.
Gauffin, Ulf; and Hellsten, Mikael. Structural support. 4,513,551, Cl. 52-364.000.
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, to Snamprogetti, S.p.A. Cryogenic process for removing acidic gases from gas mixtures. 4,514,203, Cl. 62-17.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Lodwig, Klaus; and Schefers, Friedhelm, 4,514,011, Cl. 299-42.000.
Geerts, Jan: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,514,520, Cl. 502-337.000.
General American Transportation Corporation: *See*—
Davis, Edward L.; and Mowatt-Larssen, Erling, 4,513,795, Cl. 141-35.000.
General Dynamics Pomona Division: *See*—
Palmer, John P.; and Ward, Phillip B., Jr., 4,514,057, Cl. 350-96.150.
General Electric Company: *See*—
Evans, John T., 4,514,814, Cl. 364-474.000.
Giaever, Ivar; and Keese, Richard C., 4,514,500, Cl. 435-241.000.
Hauser, Ambrose A.; Hetico, Rolf R.; and Wakeman, Thomas G., 4,513,975, Cl. 277-22.000.
Hayes, John J., Jr., 4,514,732, Cl. 340-825.570.
Kaufman, George A., III; and Kocher, Mark J., 4,514,677, Cl. 318-759.000.
Kimberlin, Dan W., 4,513,495, Cl. 29-597.000.
Lee, Ching-Pang, 4,514,144, Cl. 416-96.00R.
Leon, Joseph A., Jr.; and Caprino, Joseph C., 4,514,466, Cl. 428-383.000.
Mark, Victor, 4,514,334, Cl. 260-395.000.
Nied, Herman A., 4,514,612, Cl. 219-119.000.
General Motors Corporation: *See*—
Borman, August H.; and Koivunen, Erkki A., 4,514,147, Cl. 417-288.000.
Evans, David G., 4,513,780, Cl. 137-625.650.
Farrand, Robert M.; and Puzio, Daniel, 4,513,784, Cl. 137-854.000.
Hoffman, Charles T., Jr., 4,513,844, Cl. 188-71.600.
Koivunen, Erkki A., 4,513,631, Cl. 74-360.000.
Langmesser, Otto J., Jr.; and Rees, Richard W. A., 4,513,937, Cl. 248-394.000.
Luecders, Willi H., 4,513,933, Cl. 248-27.100.
Stevenson, Paul D., 4,513,640, Cl. 74-870.000.
Stoltman, Donald D., 4,513,775, Cl. 137-491.000.
Thomas, Michael J.; and McDonald, David B., 4,513,771, Cl. 137-315.000.
Vercruysse, Oscar D., 4,514,133, Cl. 414-512.000.
Wright, Dolph D., 4,513,777, Cl. 137-501.000.
General Signal Corporation: *See*—
Ross, Charles W., 4,514,642, Cl. 290-40.00R.
Genrich, Thad J., to Motorola, Inc. Numerically controlled oscillator. 4,514,696, Cl. 328-14.000.
Gerard, William A., to Varian Associates, Inc. High resolution position sensing apparatus with linear variable differential transformers having phase-shifted energizing signals. 4,514,689, Cl. 324-208.000.
Gerber Garment Technology, Inc.: *See*—
Forrer, Robert E.; and Postier, Robert A., 4,514,246, Cl. 156-264.000.
Gerhardt, Gilbert C. Vertically stacked double pocket. 4,513,455, Cl. 2-253.000.
Gething, Frank; and Glenn, Edward P., to Kraft, Inc. Method and apparatus for hydroponic farming. 4,513,533, Cl. 47-63.000.
Getz, Marvin G.: *See*—
Balzer, David J.; Dennison, Thomas M.; Getz, Marvin G.; and Oestmann, Eldon D., 4,514,014, Cl. 305-10.000.
Giaever, Ivar; and Keese, Richard C., to General Electric Company. Cell growth on liquid-liquid interfaces. 4,514,500, Cl. 435-241.000.
Giamei, Anthony F.; and Kear, Bernard H., to United Technologies Corporation. Wrought single crystal nickel base superalloy. 4,514,360, Cl. 420-454.000.
Giegler, Mike Charles: *See*—
McIntosh, Donald S., 4,514,002, Cl. 293-118.000.
Giguere, Jean-Paul, to Donat Flamanc Inc. Weather tight seal for the sill of a household door. 4,513,536, Cl. 49-470.000.
Gilbert, Bruce, to Hughes Tool Company. Anchor seal assembly. 4,513,822, Cl. 166-382.000.
Gilbert, John B.: *See*—
Wairegi, Tom; Boyle, Joseph P.; and Gilbert, John B., 4,514,284, Cl. 208-140.000.
Gilewicz, Stanley E.: *See*—
Kober, Alfred E.; and Gilewicz, Stanley E., 4,514,256, Cl. 162-30.110.
Gilker, Clyde, to Electric Power Research Institute, Inc. Integrating circuit for use with Hall effect sensors having offset compensation means. 4,514,685, Cl. 324-142.000.
Gillberg-LaForce, Gunilla E., to Celanese Corporation. Use of radiation-curable acrylates to surface modify polyethylene terephthalate to improve adhesion to standard rubber adhesives and thereby to rubber-based materials. 4,514,438, Cl. 427-54.100.
Gillis, John N.: *See*—
Sievers, Robert E.; and Gillis, John N., 4,514,522, Cl. 521-53.000.
Gilman, Sol: *See*—
Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, 4,514,478, Cl. 429-196.000.
Ginnasi, Alessandro: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Ginzburg, Vladimir B.; and Snitkin, Sidney R., to Tippins Machinery Company, Inc. Method and apparatus for combining automatic gauge control and strip profile control. 4,513,594, Cl. 72-8.000.
Glabiszewski, Richard, to Otto Bock Orthopadische Industrie KG. Articulated hip-joint for an artificial leg. 4,513,457, Cl. 3-15.000.
Gladish, Gary W., to AT&T Technologies, Inc. Substrate elevator mechanisms. 4,514,130, Cl. 414-416.000.
Gladish, Gary W.: *See*—
Fletcher, Ivan M.; and Gladish, Gary W., 4,513,855, Cl. 198-473.000.
Glass, Richard W.; and Koerner, Dennis W., to Frito-Lay, Inc. Crisp apple snack and process for making same. 4,514,428, Cl. 426-321.000.
Glasstech, Inc.: *See*—
Nitschke, Dean M., 4,514,208, Cl. 65-273.000.
Glenn, Edward P.: *See*—
Gething, Frank; and Glenn, Edward P., 4,513,533, Cl. 47-63.000.
Gmeinder, Hermann; and Wenger, Georg, to Kaltenbach & Voigt GmbH & Co. Arrangement for converting the pressure of a medium into an electrical signal. 4,514,604, Cl. 200-83.00N.
Goddard, E. Desmond: *See*—
Kulkarni, Ravi D.; Goddard, E. Desmond; and Aronson, Michael P., 4,514,319, Cl. 252-321.000.
Godfrey, James O.; and Godfrey, Robert E. Radio controlled vacuum cleaner. 4,513,469, Cl. 15-319.000.
Godfrey, Jollie D., Jr.: *See*—
Gordon, Eric M.; Godfrey, Jollie D., Jr.; and Natarajan, Sesha I., 4,514,391, Cl. 514-2.000.
Godfrey, Robert E.: *See*—
Godfrey, James O.; and Godfrey, Robert E., 4,513,469, Cl. 15-319.000.
Godwin, James P., Sr. Automatic self-locking roll back carrier for a vehicle. 4,514,131, Cl. 414-480.000.
Goettker, Bernhardt P.: *See*—
Law, Denny B.; and Goettker, Bernhardt P., 4,514,132, Cl. 414-537.000.
Goi, Koichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,513,958, Cl. 271-187.000.
Goldberger Foods Inc.: *See*—
Goldberger, Robert D.; and Stower, James F., 4,514,434, Cl. 426-646.000.
Goldberger, Robert D.; and Stower, James F., to Goldberger Foods Inc. Meat patty and process for forming the same. 4,514,434, Cl. 426-646.000.
Gollwitzer, Reiner, to Regogollwitzer GmbH and Co. KG. Cassette fastening structure. 4,513,999, Cl. 292-161.000.
Gomez, I. Luis, to Monsanto Company. Laminates of polycarbonate or acrylate and plasticized polyvinyl butyral. 4,514,464, Cl. 428-332.000.
Goncalves, Antonin L., to L'Oreal. Cap for a pressurized container and the corresponding unit. 4,513,890, Cl. 222-153.000.
Goodall Rubber Company: *See*—
Wise, Thomas J.; and Garratt, John N., 4,514,103, Cl. 138-106.000.
Gordon, Eric M.; Godfrey, Jollie D., Jr.; and Natarajan, Sesha I., to E. R. Squibb & Sons, Inc. Hydroxy substituted peptide compounds. 4,514,391, Cl. 514-2.000.
Gordon, Eugene I.: *See*—
Blank, Stuart L.; and Gordon, Eugene I., 4,514,756, Cl. 358-66.000.
Goscenski, Edward J., Jr., to Eaton Corporation. Positive drive and generated cam surfaces therefor. 4,513,633, Cl. 74-650.000.
Goto, Masahito: *See*—
Sato, Atsushi; Murai, Yoshikazu; Goto, Masahito; and Mochizuki, Kanji, 4,514,229, Cl. 106-135.000.
Goto, Sakichi, to Japan Mining Promotive Foundation, The. Method of smelting zinc by injection smelting. 4,514,221, Cl. 75-63.000.

Goudy, Ruth, administrator: *See*—
Goudy, William E., deceased, 4,513,869, Cl. 212-175.000.
Goudy, William E., deceased (by Goudy, Ruth, administrator), to Armco, Inc. Pedestal crane mounting system. 4,513,869, Cl. 212-175.000.
Gould Inc.: *See*—
Stowe, David W., 4,514,054, Cl. 350-96.150.
Goulter, Victor H. Adjustable support for cooking pots and the like. 4,513,936, Cl. 248-122.000.
Gouvenot, Daniel, to Soletanche. Composition for making impermeable walls and other underground structures. 4,514,228, Cl. 106-98.000.
Gow, Robert J., to Norton Company. Corner key for window spacer element. 4,513,546, Cl. 52-172.000.
Graber, John W., to Graber Products, Inc. Vehicle attached carrier. 4,513,897, Cl. 224-314.000.
Graber Products, Inc.: *See*—
Graber, John W., 4,513,897, Cl. 224-314.000.
Grabovac, Bosko; and Vuceta, Ivan N. Hydraulic wrench. 4,513,645, Cl. 81-57.390.
Grace, Jerry E.: *See*—
Grace, Virgil; and Grace, Jerry E., 4,513,526, Cl. 43-57.200.
Grace, Virgil; and Grace, Jerry E. Fishing tackle organizer. 4,513,526, Cl. 43-57.200.
Graf & Cie AG: *See*—
Bisquolm, Werner; Burki, Jorg; and Teuscher, Othmar, 4,513,480, Cl. 19-113.000.
Graham, David R., to Cannondale Corporation. Bicycle frame seat stays. 4,513,985, Cl. 280-281.00R.
Grandjean, Remy; and Guerin, Yves, to ETA S.A., Fabriques d'Ebauches. Method and device for controlling a bidirectional stepping motor. 4,514,676, Cl. 318-696.000.
Grant, Frederic F., to Bell & Howell Company. Information transferring systems operating on a recording medium. 4,514,055, Cl. 350-6.300.
Gravener, Roy D.: *See*—
Aranyi, Ernie; Ihasz, Richard; Gravener, Roy D.; and Tovey, Hugh J., 4,513,746, Cl. 128-334.00C.
Gravity Guidance, Inc.: *See*—
Killen, Robert H., 4,513,961, Cl. 272-62.000.
Greenberg, Paul B.: *See*—
Deveau, Paul J.; Greenberg, Paul B.; and Paolillo, Roger E., 4,513,567, Cl. 60-39.020.
Greenco Corporation: *See*—
Garlapaty, Venkat R., 4,513,997, Cl. 285-242.000.
Greene, Hugh W.: *See*—
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,514,684, Cl. 324-120.000.
Gregorovich, Charles J.: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,513,600, Cl. 72-345.000.
Gries, Josef: *See*—
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.
Grignon, Jacques, to Domtar Inc. Hardboard-like panel. 4,514,448, Cl. 428-68.000.
Grisez, William F.: *See*—
Maier, Otto H.; Seifert, James F.; Ryder, John C.; and Grisez, William F., 4,513,853, Cl. 198-410.000.
Gross, Leo: *See*—
Skeist, S. Merrill; and Gross, Leo, 4,514,662, Cl. 315-57.000.
Grossauer, Alfred. Connecting nipple for circumferentially ribbed insulating tubes. 4,513,998, Cl. 285-308.000.
Grosshuesch, Lee V., to Weyerhaeuser Company. Ventilated fruit fly proof produce shipper. 4,513,907, Cl. 229-23.00R.
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., to Minster Machine Company, The. Cam actuated ejector for a shell press. 4,513,600, Cl. 72-345.000.
Grumman Aerospace Corporation: *See*—
Arena, Aldo, 4,513,488, Cl. 29-516.000.
Cermignani, Justine D.; and Ganz, Frederick M., 4,514,734, Cl. 343-708.000.
Grummett, Lorne H.: *See*—
Melissa, Raymond F.; Grummett, Lorne H.; and Chamberlain, John C., 4,513,661, Cl. 101-93.040.
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., to Data General Corporation. Digital computer system including apparatus for resolving names representing data items and capable of executing instructions belonging to general instruction sets. 4,514,800, Cl. 364-200.000.
Grzinia, Michael, to Milei GmbH. Hen-egg albumen substitute and method for its manufacture. 4,514,432, Cl. 426-656.000.
GTE Automatic Electric Inc.: *See*—
Perry, Thomas J., 4,514,844, Cl. 371-8.000.
Renner, Robert E., 4,514,842, Cl. 370-63.000.
Van Husen, Hendrik W., 4,514,687, Cl. 324-158.00R.
GTE Laboratories Incorporated: *See*—
Carlsen, W. John; and Melman, Paul, 4,514,046, Cl. 350-385.000.
GTE Valeron Corporation: *See*—
Begin, John D., 4,514,797, Cl. 364-148.000.
Guerin, Yves: *See*—
Grandjean, Remy; and Guerin, Yves, 4,514,676, Cl. 318-696.000.
Gueugnon, Catherine; and Bernstein, Pierre, to Cii Honeywell Bull (Societe Anonyme). Pattern generator for integrated circuits and process of generating patterns by means of said generator. 4,514,082, Cl. 355-54.000.
Guigas, Bruno: *See*—
Schneider, Lutz; and Guigas, Bruno, 4,514,822, Cl. 364-900.000.
Gunderson, Arthur S. Portable shuffleboard court. 4,513,964, Cl. 273-126.00R.
Gunjima, Tomoki; and Takei, Ryutaro, to Asahi Glass Company Ltd. 1-(Trans-4-alkylcyclohexyl)-2-(trans-4'-(p-substituted phenyl) cyclohexyl)ethane and liquid crystal mixture. 4,514,044, Cl. 350-350.00R.
Gunson's Sortex Limited: *See*—
Culling, Michael J.; and Deefholts, Benedict M. M., 4,513,868, Cl. 209-581.000.
Gunzi, Kouichi: *See*—
Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi, Kouichi, 4,514,486, Cl. 430-124.000.
Gupta, Bhagwati P.: *See*—
Thorn, Richard P.; and Gupta, Bhagwati P., 4,514,458, Cl. 428-222.000.
Gurth, Max I. Method and apparatus for pumping fragile articles. 4,514,139, Cl. 415-90.000.
Guscott, John K., to American District Telegraph Company. Optical system for ceiling mounted passive infrared sensor. 4,514,631, Cl. 250-342.000.
Guthrie, Jesse: *See*—
Murray, Joseph; and Guthrie, Jesse, 4,513,641, Cl. 81-486.000.
Gutleber, Frank S., to United States of America, Army. Multiplexed noise code generator utilizing transposed codes. 4,514,853, Cl. 375-34.000.
Gutorski, Zygmunt: *See*—
Szczesny, Adolf; Kleinert, Reiner; Jedo, Antoni; and Gutorski, Zygmunt, 4,514,300, Cl. 210-342.000.
Gutzwiller, James E., Jr.: *See*—
Feldstein, Joel G.; and Gutzwiller, James E., Jr., 4,513,903, Cl. 228-107.000.
Guy, Robert R., to LOF Plastics Inc. Mounting of automobile trim strips. 4,514,003, Cl. 293-128.000.
Haase, William H.: *See*—
Alexander, Garold W.; and Haase, William H., 4,514,353, Cl. 264-294.000.
Haberthur-Heilig, Walter, to Bron Elektronik AG. Attachment provision for exchangeable accessories at illumination bodies. 4,514,794, Cl. 362-439.000.
Hackett, Joseph, to Eko Video Limited. Magnetic tape cassette. 4,513,928, Cl. 242-198.000.
Hadtke, Frederick B.: *See*—
Hain, Robert W.; Hadtke, Frederick B.; and Paikoff, Myron, 4,513,891, Cl. 222-213.000.
Hagemann, Hermann: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Paul, Volker; and Brandes, Wilhelm, 4,514,417, Cl. 514-482.000.
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, to Hitachi, Ltd. Defect-remediable semiconductor integrated circuit memory and spare substitution method in the same. 4,514,830, Cl. 365-200.000.
Hahn, Henry N.: *See*—
Cole, Frank J.; and Hahn, Henry N., 4,514,266, Cl. 204-28.000.
Hain, Robert W.; Hadtke, Frederick B.; and Paikoff, Myron, to Sterling Drug Inc. Spray dispensing container and valve therefor. 4,513,891, Cl. 222-213.000.
Hales, James W.: *See*—
Sodergren, Jan H.; and Hales, James W., 4,513,786, Cl. 138-89.000.
Halford, Wayne R.; and Nakano, Walter S., to Mattel, Inc. Toy vehicle game with launcher and return means. 4,513,967, Cl. 273-108.000.
Hall, Maclin S.: *See*—
Miller, Peter S.; and Hall, Maclin S., 4,514,812, Cl. 364-473.000.
Hall, Ralph R.: *See*—
Shaw, David H.; and Hall, Ralph R., 4,514,280, Cl. 208-33.000.
Halliburton Company: *See*—
Shalek, Walter F., 4,513,612, Cl. 73-155.000.
Hamanishi, Yoshinari, to Nippon Kogaku K. K. Rear conversion lens. 4,514,051, Cl. 350-465.000.
Hamano, Hideo: *See*—
Takimura, Keisuke; and Hamano, Hideo, 4,513,635, Cl. 74-713.000.
Hammarberg, Lars. Reinforced wood particle board and a method of producing it. 4,514,258, Cl. 162-107.000.
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Preparation of fluorophthalic anhydrides. 4,514,572, Cl. 549-246.000.
Hanak, Joseph J., to Energy Conversion Devices, Inc. Large area photovoltaic cell and method for producing same. 4,514,579, Cl. 136-249.000.
Hanari, Tohru: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,514,513, Cl. 502-112.000.
Hanck, Alfred; and Pauling, Horst, to Hoffmann-La Roche Inc. Panthenol derivatives. 4,514,338, Cl. 260-429.900.
Handforth, Martin R.: *See*—
Rosenbaum, Stanley D.; and Handforth, Martin R., 4,514,595, Cl. 179-16.00F.
Hangeisi, Suekiti: *See*—
Shimoji, Koji; Hangeisi, Suekiti; and Itou, Keiji, 4,513,841, Cl. 181-252.000.
Hanni, Manfred; and Brusch, Josef, to Siemens Aktiengesellschaft. Process for protected transmission of digital signals. 4,514,852, Cl. 375-1.000.

Hanrahan, James L.: *See*—
Westdale, Virgil W.; Hanrahan, James L.; and Anderson, William C., 4,514,077, Cl. 355-3.0DD.
Hanselmann, Daniel: *See*—
Binder, Rolf; Hanselmann, Daniel; and Schlepfer, Walter, 4,513,479, Cl. 19-80.00R.
Hansen, Donald W., Jr.; Baran, John S.; and Owens, William H., to G. D. Searle & Co. Tetrapeptide adamantyl amides. 4,514,332, Cl. 260-112.50E.
Hansen, Kenneth N., to Allis-Chalmers Corporation. Range shift and park lock control. 4,513,847, Cl. 192-4.00A.
Hansen, Ralph H., to Canusa Coating Systems Limited. Hindered phenolic norbornane-2,3-dicarboximides and stabilized compositions. 4,514,533, Cl. 524-89.000.
Hanson, Paul A.; and Walton, James M., to United States of America, Navy. Expendable underwater acoustic projector. 4,514,834, Cl. 367-141.000.
Hanson, Steven P.: *See*—
Zaruba, John V.; Hanson, Steven P.; Luecke, Beth E.; and Kuna, Wayne A., 4,514,175, Cl. 434-82.000.
Hara, Kiyoshi: *See*—
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, 4,514,810, Cl. 364-424.000.
Hara, Shigeo: *See*—
Wakabayashi, Hajimu; Terai, Ryohei; Yamanaka, Hiroshi; and Hara, Shigeo, 4,514,329, Cl. 252-629.000.
Harada, Denzaburo, to Kubota, Ltd. Gearing transmission. 4,513,636, Cl. 74-761.000.
Harada, Tosiharu: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,514,216, Cl. 75-0.5AA.
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, to Nippondenso Co., Ltd. Ignition timing control system with knock control for internal combustion engines. 4,513,716, Cl. 123-425.000.
Hardiman, Brendon J., Jr. Valve guard. 4,513,773, Cl. 137-382.000.
Harikae, Nobuyuki: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,514,423, Cl. 426-3.000.
Harris Corporation: *See*—
Cohen, Paul; and Young, William R., 4,514,802, Cl. 364-200.000.
Harris Graphics Corporation: *See*—
Punater, Dinesh G.; and Bastian, Donald G., 4,514,819, Cl. 364-556.000.
Harris, Thomas E., to Dominion Engineering Works Limited. Steel mill edger drive system. 4,513,599, Cl. 72-238.000.
Harrison, David E. Method of molding a plastic toilet seat hinge connectable bed plate. 4,514,356, Cl. 264-328.120.
Hartig, Kent H., to Honeywell Information Systems Inc. High speed link controller wraparound test logic. 4,514,806, Cl. 364-200.000.
Hartman, Kenneth T., to Frito-Lay, Inc. Process for preparing baked goods with improved flavor and flavor chip texture. 4,514,430, Cl. 426-549.000.
Hartness International, Inc.: *See*—
Hartness, Thomas S.; and Hartness, Thomas P., 4,513,878, Cl. 221-40.000.
Hartness, Thomas P.: *See*—
Hartness, Thomas S.; and Hartness, Thomas P., 4,513,878, Cl. 221-40.000.
Hartness, Thomas S.; and Hartness, Thomas P., to Hartness International, Inc. Carton feeding apparatus. 4,513,878, Cl. 221-40.000.
Harvey, Howard: *See*—
Hill, Michael; Megaw, John H. P. C.; and Harvey, Howard, 4,514,613, Cl. 219-121.0EC.
Harvey Hubbell Incorporated: *See*—
Fallon, David E., 4,514,005, Cl. 294-86.420.
Harzer, Peter, to Wandel & Goltermann GmbH & Co. KG. Low-noise digitally tunable phase-locked loop frequency generator. 4,514,705, Cl. 331-2.000.
Hasegawa, Akira: *See*—
Endo, Akira; Hasegawa, Akira; and Shibata, Takanori, 4,514,645, Cl. 307-10.00R.
Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to internal combustion engines at acceleration in cold conditions. 4,513,722, Cl. 123-492.000.
Hasegawa, Takashi: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.
Hashiguchi, Makoto: *See*—
Ishikawa, Yoshikazu; and Hashiguchi, Makoto, 4,513,723, Cl. 123-492.000.
Haskal, Haim M.; and Briones, Robert A., to Magnetic Peripherals Inc. On-axis achromatic quarterwave retarder prism. 4,514,047, Cl. 350-394.000.
Hatakoshi, Makoto: *See*—
Ohsumi, Tadashi; Hatakoshi, Makoto; and Kisida, Hirosi, 4,514,406, Cl. 514-352.000.
Hattori, Motoichi; and Ishigo, Hideyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic telephone answering and recording apparatus. 4,514,593, Cl. 179-2.00A.
Hattori, Torao: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,513,638, Cl. 74-866.000.
Hattrich, George A.; and Byron, Stephen J., to Reichhold Chemicals, Inc. Stain resistant polymeric insulating compositions. 4,514,539, Cl. 524-436.000.
Hauni-Werke Korber & Co. KG: *See*—
Henzelin, Bernard; and Courbat-Chavanne, Bernard, 4,513,758, Cl. 131-291.000.
Wochnowski, Waldemar; Hohm, Reinhard; Liebe, Reinhard; and Muss, Manfred, 4,513,759, Cl. 131-303.000.
Hauser, Ambrose A.; Hetico, Rolf R.; and Wakeman, Thomas G., to General Electric Company. Thermally responsive labyrinth seal. 4,513,975, Cl. 277-22.000.
Hawerkamp, Manfred. Method and device for testing welds of thermoplastic parts. 4,513,605, Cl. 73-40.000.
Hawrylo, Frank Z.: *See*—
Rao, Srinivas T.; and Hawrylo, Frank Z., 4,514,265, Cl. 204-15.000.
Hayashi, Tetsuaki; Kabu, Masahiro; and Yamashita, Nobuyuki, to Kubota, Ltd. Agricultural tractor. 4,513,834, Cl. 180-70.100.
Hayashida, Hazime: *See*—
Muramatsu, Shigeru; Fujiwara, Yuji; Hayashida, Hazime; and Yamamoto, Jun, 4,513,652, Cl. 84-20.000.
Hayashida, Takanori, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system for spark ignition engine of fuel injection type. 4,513,700, Cl. 123-179.00L.
Hayden, William L., to Ford Motor Company. Windshield wiper element. 4,513,468, Cl. 15-250.360.
Hayes, John J., Jr., to General Electric Company. Technique for increasing battery life in remote control transmitters. 4,514,732, Cl. 340-825.570.
Hayes, Richmond S., Jr.: *See*—
Jennings, William B.; Shelton, Edward B.; and Hayes, Richmond S., Jr., 4,513,586, Cl. 62-263.000.
Hayes, Terry S., to Mitch's Self Service Gas, Inc. Storage tank gauging measuring apparatus. 4,513,617, Cl. 73-313.000.
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., to United States of America, Army. Acoustic waveguide voltage monitor. 4,514,684, Cl. 324-120.000.
Health Care Concepts, Inc.: *See*—
Meierhoefer, Eugene J., 4,513,871, Cl. 215-32.000.
Heather, James B.; and Kanne, David B., to Stauffer Chemical Company. 4-(2,6-Dialkylphenylamino)-3-alkoxy-2-butenoic acid and their use as herbicides. 4,514,215, Cl. 71-107.000.
Hedin, Jan-Erik: *See*—
Lindblom, Thore; Hedin, Jan-Erik; and Wickstrom, Sven, 4,513,799, Cl. 144-379.000.
Hedrick, George. Adjustable shoe tap. 4,513,519, Cl. 36-113.000.
Hedrick, Robert, to Mailroom Systems, Inc. Signature stacker including improved intercept means. 4,514,128, Cl. 414-49.000.
Hegler, Ralph-Peter: *See*—
Hegler, Wilhelm; and Hegler, Ralph-Peter, 4,513,787, Cl. 138-166.000.
Hegler, Wilhelm; and Hegler, Ralph-Peter, to Hegler, Wilhelm. Corrugated sheathing hose. 4,513,787, Cl. 138-166.000.
Heierling of Switzerland, Ltd.: *See*—
Koch, Albin G., 4,513,520, Cl. 36-119.000.
Heikkila, Sakari; and Tiuri, Martti, to A.Ahlstrom Osakeyhtio. Flaw detection system using microwaves. 4,514,680, Cl. 324-58.50A.
Heiland, Bernd, to (Firma) Aug. Winkhaus. Alarm system to secure a passage. 4,514,625, Cl. 250-221.000.
Heilweil, Israel J., to Mobil Oil Corporation. High temperature stable fluids for wellbore treatment containing non-aqueous solvents. 4,514,310, Cl. 252-8.55R.
Heimovics, John F., Jr., to B. F. Goodrich Company, The. Temperature compensator for pressure regulator. 4,513,881, Cl. 222-54.000.
Hellman, Erik: *See*—
Borrman, Bo; Hellman, Erik; Ode, Bengt; and van Santen, Aart, 4,514,358, Cl. 376-362.000.
Hellsten, Mikael: *See*—
Gauffin, Ulf; and Hellsten, Mikael, 4,513,551, Cl. 52-364.000.
Helstrom, John J.: *See*—
Mahoney, John A.; Helstrom, John J.; and Tait, A. Martin, 4,514,279, Cl. 208-10.000.
Hemp, John: *See*—
McHale, Edward J.; Hussain, Yousif A.; Sanderson, Michael L.; and Hemp, John, 4,513,624, Cl. 73-861.120.
Hempe Manufacturing Co.: *See*—
Keddie, David P.; and Shaw, Richard J., 4,513,466, Cl. 15-29.000.
Hendrickson, James B.; and Rodriguez, Cesar. Synthesis of 1-substituted isoquinolines. 4,514,569, Cl. 546-146.000.
Henig, Klaus: *See*—
Bottigheimer, Andreas; Einsele, Karl-Heinz; and Henig, Klaus, 4,514,835, Cl. 368-118.000.
Henk, Hermann: *See*—
Michna, Martin; and Henk, Hermann, 4,514,188, Cl. 8-641.000.
Henkel Corporation: *See*—
Thompson, John A., 4,514,184, Cl. 8-94.210.
Henningsen, Charles G.: *See*—
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,514,029, Cl. 339-143.00R.
Henslee, Walter W.; and Foster, Stephen I., to Dow Chemical Company, The. Fluoride-substituted cobalt spinels. 4,514,518, Cl. 502-229.000.
Henzelin, Bernard; and Courbat-Chavanne, Bernard, to Hauni-Werke Korber & Co. KG. Method and apparatus for increasing the volume of tobacco. 4,513,758, Cl. 131-291.000.
Heraeus Quarschmelze GmbH: *See*—
Aldinger, Fritz; Bischoff, Albrecht; Keilberth, Richard; and Sperner, Franz, 4,514,589, Cl. 174-119.00R.

Heraud, Louis, to Societe Europeenne De Propulsion. Method for adhesively bonding parts made of refractory materials. 4,514,240, Cl. 156-89.000.
Herbert, Phil. Plug locking device. 4,514,026, Cl. 339-75.00P.
Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Removable tension member for a grout anchor. 4,513,556, Cl. 52-698.000.
Herbulot, Alain, to Cycles Peugeot. Method for locally deforming a round tube into a tube comprising planar surfaces and a forming punch for carrying out said method. 4,513,601, Cl. 72-398.000.
Hercules Incorporated: *See*—
Burdick, Charles L., 4,514,292, Cl. 209-167.000.
Herman, David E.: *See*—
McGarry, Phillip E.; Herman, David E.; Treskot, Robert A.; and Fistner, David C., Sr., 4,514,291, Cl. 209-166.000.
Hermann Hirsch Leder- und Kunststoffwarenfabrik: *See*—
Hirsch, Hermann, 4,513,896, Cl. 224-178.000.
Herrington, Fox J., Jr., to Mobil Oil Corporation. Bag transporter, folder and loader and method for operation. 4,513,559, Cl. 53-429.000.
Herrlander, Bo, to Flakt Aktiebolag. Absorption tower for gas washing. 4,514,196, Cl. 55-223.000.
Herschler, Robert J. Dietary and pharmaceutical uses of methylsulfonylmethane and compositions comprising it. 4,514,421, Cl. 514-711.000.
Hesketh, Bernard; and Pumphrey, Nicholas W. J., to Imperial Chemical Industries PLC. Electrode for electrochemical processes. 4,514,274, Cl. 204-290.00F.
Hester, Jackson B., Jr.; and Ludens, James H., to Upjohn Company, The. 1-Ethanamine-triazolo-benzodiazepines as diuretics. 4,514,407, Cl. 514-220.000.
Hetico, Rolf R.: *See*—
Hauser, Ambrose A.; Hetico, Rolf R.; and Wakeman, Thomas G., 4,513,975, Cl. 277-22.000.
Hewlett-Packard Company: *See*—
Meyer, John D., 4,514,741, Cl. 346-140.00R.
Roland, James P., 4,514,252, Cl. 156-643.000.
Heyde, John B.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.
Heyman, Joseph S.; and Brandenburger, Gary H., to United States of America, National Aeronautics and Space Administration. Method for thermal monitoring subcutaneous tissue. 4,513,750, Cl. 128-660.000.
Hidai, Yutaka: *See*—
Iwata, Kazuhide; Shibayama, Shigeki; Hidai, Yutaka; and Oyanagi, Shigeru, 4,514,826, Cl. 364-900.000.
Hidaka, Yoshiaki: *See*—
Senga, Akihisa; Hidaka, Yoshiaki; and Tsuchiyama, Tadashi, 4,513,698, Cl. 123-52.0MV.
Higuchi, Masaru: *See*—
Makino, Hiroshi; Higuchi, Masaru; and Murata, Kazuou, 4,514,084, Cl. 356-4.000.
Hill, Michael; Megaw, John H. P. C.; and Harvey, Howard, to Lucas Industries PLC, Great King St. Method of an apparatus for welding together metal components. 4,514,613, Cl. 219-121.0EC.
Hinde, Walter R.: *See*—
Nieminski, Robert A.; and Hinde, Walter R., 4,513,839, Cl. 180-253.000.
Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,513,508, Cl. 33-288.000.
Hinze, Klaus: *See*—
Fricke, Reinhard L.; Hinze, Klaus; Huth, Manfred K. O.; and Wisskirchen, Klaus B., 4,514,609, Cl. 200-159.00A.
Hira, Yasuo: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, to Sanden Corporation. Scroll type compressor with displacement adjusting mechanism. 4,514,150, Cl. 417-440.000.
Hirahara, Shuzo: *See*—
Nagato, Hitoshi; Izawa, Koji; and Hirahara, Shuzo, 4,514,738, Cl. 346-76.0PH.
Hirai, Hiroyuki; Sato, Kozo; and Kawata, Ken, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material with base precursor particles. 4,514,493, Cl. 430-617.000.
Hirai, Kenji: *See*—
Kariatsumari, Keiichiro; and Hirai, Kenji, 4,514,699, Cl. 330-53.000.
Hirakawa, Kiyoshi: *See*—
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, 4,514,459, Cl. 428-229.000.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Creeping preventing apparatus in automatic transmission for vehicle. 4,513,639, Cl. 74-866.000.
Hirano, Kazuo: *See*—
Abe, Hiroshi; Sato, Nobuhiro; Ono, Kimizo; and Hirano, Kazuo, 4,513,751, Cl. 128-666.000.
Hirano, Nagayoshi, to Fuji Photo Optical Co., Ltd. Zoom lens system for finite conjugate distances. 4,514,049, Cl. 350-425.000.
Hiraoka, Takeshi: *See*—
Umeha, Genkichi; and Hiraoka, Takeshi, 4,513,977, Cl. 277-96.200.
Hirata, Toshiyuki: *See*—
Takeda, Keisou; and Hirata, Toshiyuki, 4,513,720, Cl. 123-470.000.
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, to Eisai Ci., Ltd. Phenothiazine derivatives and anti-psychotic drugs containing the same. 4,514,395, Cl. 514-224.000.
Hirsch, Arthur, to Arvey Corporation. Steam sterilization indicator. 4,514,361, Cl. 422-26.000.
Hirsch, Hermann, to Hermann Hirsch Leder- und Kunststoffwarenfabrik. Belt or strap. 4,513,896, Cl. 224-178.000.
Hirschfeld, Steven, to Biond Inc. Assaying for a multiplicity of antigens or antibodies with a detection compound. 4,514,508, Cl. 436-518.000.
Hirt, Manfred, to Zahnraderfabrik Renk A.G. Gearing assembly. 4,513,637, Cl. 74-801.000.
Hisatomi, Yasukiro: *See*—
Kanebako, Hiromu; and Hisatomi, Yasukiro, 4,514,149, Cl. 417-403.000.
Hitachi Koki Co., Ltd.: *See*—
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, 4,514,079, Cl. 355-8.000.
Hitachi, Ltd.: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.
Ashida, Akira, 4,514,854, Cl. 375-94.000.
Endo, Akira; Hasegawa, Akira; and Shibata, Takanori, 4,514,645, Cl. 307-10.00R.
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, 4,514,830, Cl. 365-200.000.
Ishii, Toshio; and Sugiura, Noboru, 4,513,718, Cl. 123-425.000.
Ito, Tosikazu; and Takahashi, Reijiro, 4,513,808, Cl. 165-43.000.
Kanoi, Minoru; Hori, Yasuro; and Kamata, Yuzuru, 4,514,714, Cl. 336-100.000.
Kasagi, Kunisuke; and Kawashima, Machio, 4,514,664, Cl. 315-383.000.
Kimura, Takashi; Mochiji, Kozo; and Obayashi, Hidehito, 4,514,857, Cl. 378-034.000.
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, 4,514,766, Cl. 358-213.000.
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, 4,514,747, Cl. 357-38.000.
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, 4,514,079, Cl. 355-8.000.
Sato, Kanemasa; and Ueno, Sadayasu, 4,513,615, Cl. 73-204.000.
Hitachi Microcumputer Engineering Ltd.: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.
Hiyoshi, Takanori: *See*—
Sasaki, Masafumi; Kashiwagi, Susumu; and Hiyoshi, Takanori, 4,513,569, Cl. 60-39.310.
Ho, Teh C.; and Pan, Wie-Hin, to Exxon Research and Engineering Co. Supported, self-promoted molybdenum and tungsten sulfide catalysts formed from bis(tetrathiometallate) precursors, and their preparation. 4,514,517, Cl. 502-220.000.
Hobart Corporation: *See*—
Treiber, Fritz F., 4,513,558, Cl. 53-77.000.
Hobas-Engineering AG: *See*—
Jost, Ralph, 4,513,996, Cl. 285-110.000.
Hobbs, Arthur G., Jr.: *See*—
Proctor, Robert H.; and Hobbs, Arthur G., Jr., 4,513,578, Cl. 62-149.000.
Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,514,519, Cl. 502-243.000.
Hobbs, Robert N.: *See*—
Dzewaltowski, Victor F.; and Hobbs, Robert N., 4,513,540, Cl. 51-165.710.
Hoechst Aktiengesellschaft: *See*—
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,514,328, Cl. 252-609.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,514,411, Cl. 514-215.000.
Tegeler, John J.; and Diamond, Craig J., 4,514,410, Cl. 514-221.000.
Hoffman, Charles T., Jr., to General Motors Corporation. Disc brake shoe retainer assembly with insulation. 4,513,844, Cl. 188-71.600.
Hoffmann-La Roche Inc.: *See*—
Hanck, Alfred; and Pauling, Horst, 4,514,338, Cl. 260-429.900.
Luthy, Christoph; and Winternitz, Paul, 4,514,566, Cl. 544-56.000.
Hogan, Lawrence R., to Cole-Parmer Instrument Company. Dispenser having a flexible fluid container and a rotor compressible fluid discharge tube. 4,513,885, Cl. 222-95.000.
Hogan, Lawrence R.: *See*—
Miller, Carl; and Hogan, Lawrence R., 4,513,796, Cl. 141-83.000.
Hogrogian, Richard H.: *See*—
Ameen, Joseph G.; Hogrogian, Richard H.; and Smey, Samuel L., 4,514,232, Cl. 134-1.000.
Hohm, Reinhard: *See*—
Wochnowski, Waldemar; Hohm, Reinhard; Liebe, Reinhard; and Muss, Manfred, 4,513,759, Cl. 131-303.000.
Hok, Bertil: *See*—
Adolfsson, Morgan; Brogardh, Iorgny; Hok, Bertil; and Ovren, Christer, 4,514,860, Cl. 455-612.000.
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, to Dai Nippon Toryo Co., Ltd.; and Mitsubishi Yuka Fine Chemicals Co., Ltd. Process for forming a corrosion resistant coating. 4,514,445, Cl. 427-410.000.
Holder, James D.: *See*—
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,514,684, Cl. 324-120.000.

Hollingsworth, Alexander, to Nordson Corporation. Skin packaging machine with inclined oven. 4,513,560, Cl. 53-509.000.
Hollis, Ralph L., Jr.; and Musits, Bela L., to International Business Machines Corporation. Electromagnetic X-Y-Theta precision positioner. 4,514,674, Cl. 318-687.000.
Holmberg, Joyce D.: *See*—
Kinney, Ohler L., Jr.; and Holmberg, Joyce D., 4,514,202, Cl. 55-440.000.
Holmes, Dale A.; and Waite, Thomas R., to Rockwell International Corporation. Common-pass decentered annular ring resonator. 4,514,850, Cl. 372-95.000.
Holubka, Joseph W., to Ford Motor Company. Crosslinkable composition of matter-I. 4,514,548, Cl. 525-528.000.
Holubka, Joseph W., to Ford Motor Company. Crosslinkable composition of matter-IV. 4,514,549, Cl. 525-528.000.
Holzermer, Gunter, to Siemens Aktiengesellschaft. Collimator for an X-ray examination apparatus. 4,514,859, Cl. 378-152.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei, 4,513,722, Cl. 123-492.000.
Ishikawa, Yoshikazu; and Hashiguchi, Makoto, 4,513,723, Cl. 123-492.000.
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, 4,513,702, Cl. 123-193.00H.
Koumura, Takashi; and Nakajima, Toyohei, 4,513,713, Cl. 123-339.000.
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,513,638, Cl. 74-866.000.
Senga, Akihisa; Hidaka, Yoshiaki; and Tsuchiyama, Tadashi, 4,513,698, Cl. 123-52.0MV.
Tsuboi, Masaharu, 4,513,838, Cl. 180-219.000.
Honda Motor Co., Ltd.: *See*—
Maruoka, Sigehiro, 4,514,006, Cl. 296-78.100.
Honeywell Inc.: *See*—
Bartels, James I., 4,513,909, Cl. 236-26.00R.
Bartels, James I., 4,513,910, Cl. 236-26.00R.
Boyer, Don S.; and Freeborn, John C., 4,514,176, Cl. 434-224.000.
Honeywell Information Systems Inc.: *See*—
Anderson, Nils A., 4,514,815, Cl. 364-478.000.
Hartig, Kent H., 4,514,806, Cl. 364-200.000.
Mirow, Fred A.; and Quinones, Matthew M., 4,514,820, Cl. 364-858.000.
Honzyo, Isao: *See*—
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,514,287, Cl. 208-309.000.
Hopkins, George D., Jr. Apparatus for and method of constructing, transporting and erecting a structure of two or more stories comprised of a plurality of prefabricated core modules and panelized room elements. 4,513,545, Cl. 52-79.100.
Hori, Yasuro: *See*—
Kanoi, Minoru; Hori, Yasuro; and Kamata, Yuzuru, 4,514,714, Cl. 336-100.000.
Horiba, Ltd.: *See*—
Ishida, Kozo; and Imaki, Takao, 4,514,635, Cl. 250-343.000.
Horii, Ichiro: *See*—
Tashiro, Chiaki; Kawakita, Takeshi; Horii, Ichiro; and Anami, Koretake, 4,514,403, Cl. 514-274.000.
Horiko, Kouki: *See*—
Kita, Yukio; Koide, Kazuo; and Horiko, Kouki, 4,514,501, Cl. 435-251.000.
Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,514,156, Cl. 418-173.000.
Horiuchi, Masatada: *See*—
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, 4,514,830, Cl. 365-200.000.
Hornung, Phillip A.: *See*—
De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., 4,514,691, Cl. 324-301.000.
Hosomizu, Hiroshi: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.
Hosoya, Toshiro, to Tobishi Industries Ltd. Compact capacitor motor with thin coil cores. 4,514,655, Cl. 310-218.000.
Hotta, Yuji: *See*—
Koitabashi, Takeo; Matsuzaka, Syoji; Hotta, Yuji; and Iwata, Masatoshi, 4,514,491, Cl. 430-567.000.
Hougen, Everett D. Chip breaker for annular hole cutting tools. 4,514,120, Cl. 409-137.000.
Houghtalen, Steven R.: *See*—
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.
Houssian, Vazgen J.: *See*—
Dowzall, Martin E.; and Houssian, Vazgen J., 4,513,511, Cl. 33-447.000.
Howat, Robert J.: *See*—
Shannon, Michael A.; and Howat, Robert J., 4,514,435, Cl. 427-8.000.
Howmedica, Inc.: *See*—
Johns, Owen L., 4,513,739, Cl. 128-156.000.
Hoyer, Gale G.: *See*—
Inoue, Kimio; Hoyer, Gale G.; and Bates, Stanley I., 4,514,574, Cl. 564-424.000.
Hrdlicka, Karel: *See*—
Janda, Jiri; and Hrdlicka, Karel, 4,514,838, Cl. 369-254.000.
Hsiao, Cheng-Kuo: *See*—
Loutfy, Rafik O.; and Hsiao, Cheng-Kuo, 4,514,482, Cl. 430-78.000.
Hsu, Oscar H. H.; and Tassler, Milford C., to Masonite Corporation. Modified phenol-formaldehyde resin and the production thereof. 4,514,532, Cl. 524-14.000.
Huber, Marion: *See*—
Kaspar, Klaus P.; Becker, Jurgen; and Huber, Marion, 4,514,091, Cl. 366-130.000.
Hubert, Miffre, to Societe Nationale Elf Aquitaine (Production). Sealing system for a well bore in which a hot fluid is circulated. 4,513,816, Cl. 166-75.00R.
Hubred, Gale L., to Chevron Research Company. Leaching nickel, cobalt, molybdenum, tungsten, and vanadium from spent hydroprocessing catalysts. 4,514,368, Cl. 423-54.000.
Hubred, Gale L.; and Van Leirsburg, Dean A., to Chevron Research Company. Recovery of cobalt, molybdenum, nickel, tungsten and vanadium from an aqueous ammonia and ammonium salt solution by coextracting molybdenum, tungsten and vanadium and sequential extraction of nickel and cobalt. 4,514,369, Cl. 423-54.000.
Huffman, William A.; and Brown, Harvey A., to Minnesota Mining and Manufacturing Company. Helichromic-smectic liquid crystal compositions and display cells. 4,514,045, Cl. 350-351.000.
Hughes, Charles C., to R. A. Jones & Co. Inc. Apparatus for forming a flip top carton. 4,514,181, Cl. 493-131.000.
Hughes Tool Company: *See*—
Gilbert, Bruce, 4,513,822, Cl. 166-382.000.
Wadhwa, Suresh K., 4,514,309, Cl. 252-8.55R.
Hughes, Vincent L.; and Benitez, Francisco M., to Exxon Research and Engineering Co. Petroleum resin and pressure sensitive adhesive formulations utilizing same as tackifier. 4,514,554, Cl. 526-339.000.
Huignard, Jean P.: *See*—
Pichon, Laurence; and Huignard, Jean P., 4,514,038, Cl. 350-162.130.
Hummel, Peter; and Kunkel, Fred, to M.A.N. Roland Druckmaschinen Aktiengesellschaft. Mechanism for varying the axial travel of a distributing roller in a printing machine. 4,513,663, Cl. 101-349.000.
Humphreys, Norman G.; and Dean, Raymond H., to Tempmaster Corporation. Low Temperature air conditioning system and method 4,513,574, Cl. 62-59.000.
Humpolik, Bohumil; and Staffa, Karl-Heinz, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG. Evaporator particularly suitable for air conditioners in automotive vehicles. 4,513,587, Cl. 62-515.000.
Hunt, George F.: *See*—
Pittman, Luther B.; Agner, Jennings M.; and Hunt, George F., 4,513,756, Cl. 131-111.000.
Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,513,804, Cl. 160-174.000.
Hunter, Douglas L., to Dow Chemical Company, The. Method of preparing tetrarhodium dodecacarbonyl. 4,514,380, Cl. 423-417.000.
Husqvarna Aktiebolag: *See*—
Skogward, Kenneth O. E., 4,513,678, Cl. 112-323.000.
Hussain, Yousif A.: *See*—
McHale, Edward J.; Hussain, Yousif A.; Sanderson, Michael L.; and Hemp, John, 4,513,624, Cl. 73-861.120.
Husson, Didier: *See*—
Kino, Gordon S.; Bennett, Simon D.; and Husson, Didier, 4,513,749, Cl. 128-660.000.
Huth, Manfred K. O.: *See*—
Fricke, Reinhard L.; Hinze, Klaus; Huth, Manfred K. O.; and Wisskirchen, Klaus B., 4,514,609, Cl. 200-159.00A.
Hwang, James C., to AT&T Bell Laboratories. Method of substrate heating for deposition processes. 4,514,250, Cl. 156-610.000.
Hwang, Sang-Hak, to Du Pont de Nemours, E. I., and Company. Nonwoven fabric for apparel insulating interliner. 4,514,455, Cl. 428-198.000.
Hydril Company: *See*—
Hynes, Joseph H.; and Morrill, Charles D., 4,513,823, Cl. 166-386.000.
Hydro-Quebec: *See*—
Simoneau, Raynald; Pelletier, Jean-Marc; Di Vincenzo, Antonio; and Boillot, Jean-Paul, 4,514,615, Cl. 219-132.000.
Hyllberg, Bruce E.: *See*—
Brands, George B.; and Hyllberg, Bruce E., 4,513,660, Cl. 101-1.000.
Hynes, Joseph H.; and Morrill, Charles D., to Hydril Company. Cylindrical gate valve apparatus and method. 4,513,823, Cl. 166-386.000.
Iblings, Jackson R., to Plummer, Walter Allen, III. Seam closure device. 4,513,484, Cl. 24-437.000.
Ichijo, Hisao: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Ichikawa, Kentaro: *See*—
Inagaki, Taizo; Ichikawa, Kentaro; Kido, Hitoshi; and Kawase, Yozo, 4,514,138, Cl. 415-1.000.
Ichizawa, Yoshiyuki; Nomoto, Tsugio; and Oshida, Mamoru, to Yoshino Kogyosho Co., Ltd. Device for removing and conveying injection-molded piece. 4,514,166, Cl. 425-436.00R.
Idemitsu Kosan Company Limited: *See*—
Taniguchi, Isoji; and Kimura, Yoshiharu, 4,514,555, Cl. 528-9.000.
Idota, Yoshio; and Inoue, Noriyuki, to Fuji Photo Film Co., Ltd. Silver salt diffusion transfer process using hydroxylamine and pyrazolidinone developing agents. 4,514,488, Cl. 430-234.000.

Ie, Katsuji: *See*—
Iida, Shinzo; Ie, Katsuji; and Miyazaki, Jun, 4,513,806, Cl. 164-413.000.
Igashira, Toshihiko; and Yoshinaga, Toru, to Nippon Soken, Inc. Spark plug having dual gaps for internal combustion engines. 4,514,657, Cl. 313-130.000.
Iguchi, Katsuhiko; Wada, Hidemi; and Wakita, Ryuichi, to Toshiba Kikai Kabushiki Kaisha. Method and apparatus for adjusting die clearance. 4,514,348, Cl. 264-40.100.
Ihasz, Richard: *See*—
Aranyi, Ernie; Ihasz, Richard; Gravener, Roy D.; and Tovey, Hugh J., 4,513,746, Cl. 128-334.00C.
Iida, Manjiro: *See*—
Murayama, Masaki; and Iida, Manjiro, 4,514,808, Cl. 364-200.000.
Iida, Shinzo; Ie, Katsuji; and Miyazaki, Jun, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for withdrawing solidified rod in horizontal type continuous casting machines. 4,513,806, Cl. 164-413.000.
Iimori, Hiroshi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.
Iizuka, Yo: *See*—
Shiiki, Zenya; Iizuka, Yo; and Kawakami, Yukichika, 4,514,558, Cl. 528-388.000.
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, to Nippon Oil Co., Ltd. Process for the solvent deasphalting of asphaltene-containing hydrocarbons. 4,514,287, Cl. 208-309.000.
Imada, Isuke; and Watanabe, Masazumi, to Takeda Chemical Industries, Ltd. Antifibrotic agent. 4,514,420, Cl. 514-689.000.
Imada, Kiyohisa: *See*—
Shinohara, Satoru; Fujii, Noboru; Imada, Kiyohisa; Kadota, Genichi; and Ueno, Hideo, 4,514,560, Cl. 536-1.100.
Imai, Tomoyuki: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,514,216, Cl. 75-0.5AA.
Imai, Toshiki: *See*—
Sainen, Tsutomu; Sakano, Toshiyuki; Fujita, Yoshitaka; and Imai, Toshiki, 4,513,790, Cl. 139-110.000.
Imaki, Takao: *See*—
Ishida, Kozo; and Imaki, Takao, 4,514,635, Cl. 250-343.000.
Immel, Otto; Schwarz, Hans-Helmut; Quast, Hein; and Bandtel, Eberhard, to Bayer Aktiengesellschaft. Process for the preparation of trimethylolpropane. 4,514,578, Cl. 568-853.000.
Imoda, Kinichiro; Kawai, Toshinori; and Nishitani, Kimio, to Aichi Spinning Co., Ltd. Method and apparatus for detecting fluctuations of monitoring standard of thread-knotting monitor in auto-winder. 4,513,921, Cl. 242-36.000.
Imperial Chemical Industries PLC: *See*—
Hesketh, Bernard; and Pumphrey, Nicholas W. J., 4,514,274, Cl. 204-290.00F.
Ming, Paul T., 4,514,730, Cl. 340-815.260.
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control device for internal combustion engines. 4,513,721, Cl. 123-478.000.
Ina, Toshikazu: *See*—
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,513,628, Cl. 73-862.340.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, 4,513,626, Cl. 73-862.340.
Inagaki, Etsuo, to Daidotokushuko Kabushikikaisha. Reduced iron melting method using electric arc furnace. 4,514,218, Cl. 75-12.000.
Inagaki, Taizo; Ichikawa, Kentaro; Kido, Hitoshi; and Kawase, Yozo, to Tokyo Shibaura Denki Kabushiki Kaisha. Leakage water discharge method and apparatus in a reversible hydraulic machine. 4,514,138, Cl. 415-1.000.
INCO Limited: *See*—
Devuyst, Eric A.; and Ettel, Victor A., 4,514,372, Cl. 423-493.000.
Inculet, Ion I., to Blue Circle Industries PLC. Method and apparatus for separating particulate materials. 4,514,289, Cl. 209-127.300.
Indiana University Foundation: *See*—
Kohler, Richard B.; and White, Arthur C., 4,514,509, Cl. 436-518.000.
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, to Tokyo Shibaura Denki Kabushiki Kaisha; and Toshiba Ceramics Co., Ltd. Process for preparing silicon nitride powder. 4,514,370, Cl. 423-344.000.
Inoue, Kimio; Hoyer, Gale G.; and Bates, Stanley I., to Dow Chemical Company, The. Process for separating isomeric mixtures. 4,514,574, Cl. 564-424.000.
Inoue, Noriyuki: *See*—
Idota, Yoshio; and Inoue, Noriyuki, 4,514,488, Cl. 430-234.000.
Matsuzawa, Kiyoshi; and Inoue, Noriyuki, 4,514,080, Cl. 355-14.00C.
Inoue, Teruhiko: *See*—
Nakai, Mamoru; Iwata, Fumio; and Inoue, Teruhiko, 4,514,571, Cl. 546-306.000.
Inoue, Toru: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.
Inoue, Yozo: *See*—
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, 4,514,810, Cl. 364-424.000.
Inoue, Yukinobu. Directional control valve. 4,513,783, Cl. 137-625.680.
Institut de Recherches de la Siderurgie Francaise: *See*—
de Saint Martin, Lucien, 4,514,219, Cl. 75-43.000.
Institut Francais du Petrole: *See*—
Travers, Christine; Chan, Trinh D.; Snappe, Roger; and Bournonville, Jean-Paul, 4,514,515, Cl. 502-154.000.
Intel Corporation: *See*—
Washburn, Hudson A., 4,514,827, Cl. 365-1.000.
International Business Machines Corporation: *See*—
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.
Ameen, Joseph G.; Hogrogian, Richard H.; and Smey, Samuel L., 4,514,232, Cl. 134-1.000.
Bhattacharya, Somnath, 4,514,751, Cl. 357-71.000.
Chao, Hu H., 4,514,829, Cl. 365-189.000.
Darves-Bornoz, Yves; Melvin, George E.; Ryan, Michael G.; and Saylor, Dennis L., 4,513,613, Cl. 73-159.000.
Engel, Peter A.; Strope, Douglas H.; and Wray, Thomas E., 4,514,752, Cl. 357-72.000.
Hollis, Ralph L., Jr.; and Musits, Bela L., 4,514,674, Cl. 318-687.000.
Klepner, Stephen P., 4,514,254, Cl. 156-656.000.
Mendelson, Richard N.; O'Neal, Douglas M.; and Sharp, Leo A., Jr., 4,514,823, Cl. 364-900.000.
Sakmann, Walter H.; and Zimmermann, Volker, 4,514,667, Cl. 318-254.000.
International Coal Refining Company: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; Davis, Burtron H.; and Schweighardt, Frank K., 4,514,281, Cl. 208-47.000.
International Export Company: *See*—
Klaus, Dale A., 4,514,792, Cl. 362-294.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,513,757, Cl. 131-276.000.
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,094, Cl. 366-160.000.
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,431, Cl. 426-641.000.
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,514,324, Cl. 252-522.00R.
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,514,429, Cl. 426-535.000.
International Paper Company: *See*—
Alexander, Garold W.; and Haase, William H., 4,514,353, Cl. 264-294.000.
International Standard Electric Corporation: *See*—
Alexander, John H., 4,514,441, Cl. 427-126.600.
Interpace Corporation: *See*—
Wheeler, Edward S., 4,514,591, Cl. 174-182.000.
Intevep, S.A.: *See*—
Vadasz, Amnon F., 4,513,778, Cl. 137-533.110.
Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; and Inui, Toshiharu, 4,514,736, Cl. 346-76.0PH.
Inukai, Kenichi: *See*—
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, 4,514,551, Cl. 526-233.000.
Invocas, Inc.: *See*—
Stol, Israel, 4,514,125, Cl. 411-82.000.
Ippolito, Rodolfo M., to Dresser Industries, Inc. Wound wire bearing. 4,514,098, Cl. 384-95.000.
Irie, Yasuo: *See*—
Nojiri, Takeo; and Irie, Yasuo, 4,514,146, Cl. 416-200.00R.
Irmscher, Klaus; and Uhl, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. Use of adenosine derivatives as anticonvulsants. 4,514,405, Cl. 514-46.000.
Isett, Donald D.: *See*—
Martell, Charles R.; Isett, Donald D.; and Abney, Paul A., 4,513,676, Cl. 112-262.100.
Ishibashi, Takashi: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.
Ishida, Kozo; and Imaki, Takao, to Horiba, Ltd. Non-dispersive infrared analyzer. 4,514,635, Cl. 250-343.000.
Ishida, Masaaki: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Ishigo, Hideyasu: *See*—
Hattori, Motoichi; and Ishigo, Hideyasu, 4,514,593, Cl. 179-2.00A.
Ishii, Toshio; and Sugiura, Noboru, to Hitachi, Ltd. Apparatus for controlling ignition timing for internal combustion engines. 4,513,718, Cl. 123-425.000.
Ishikawa, Norikatu: *See*—
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Ishikawa, Yoshikazu; and Hashiguchi, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for internal combustion engines at acceleration. 4,513,723, Cl. 123-492.000.
Ishizawa, Toshimichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,514,768, Cl. 358-296.000.
Islip, Philip N.; and Shu, Winston R., to Mobil Oil Corporation. Cyclic solvent assisted steam injection process for recovery of viscous oil. 4,513,819, Cl. 166-263.000.

Isozaki, Osamu: *See*—
Sugimoto, Kenji; and Isozaki, Osamu, 4,514,471, Cl. 428-703.000.
Isaakainen, Onni, to Oy Tampella AB. Method of and apparatus for installing solder bolts in rock bolting. 4,514,111, Cl. 405-260.000.
Ito, Hiroshi: *See*—
Kobayashi, Nobuyuki; Ito, Hiroshi; and Ohkawa, Nobuhisa, 4,513,710, Cl. 123-339.000.
Ito, Koichi: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Ito, Kunio: *See*—
Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi. Kouichi, 4,514,486, Cl. 430-124.000.
Ito, Masaaki: *See*—
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, 4,514,459, Cl. 428-229.000.
Ito, Tosikazu; and Takahashi, Reijiro, to Hitachi, Ltd. Automobile air conditioner. 4,513,808, Cl. 165-43.000.
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, to Nippondenso Co., Ltd. Navigator for vehicles. 4,514,810, Cl. 364-424.000.
Itou, Keiji: *See*—
Shimoji, Koji; Hangeisi, Suekiti; and Itou, Keiji, 4,513,841, Cl. 181-252.000.
Itow, Hisao: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.
ITT Industries, Inc.: *See*—
Fricke, Reinhard L.; Hinze, Klaus; Huth, Manfred K. O.; and Wisskirchen, Klaus B., 4,514,609, Cl. 200-159.00A.
Ivanov, Alexander L.: *See*—
Tzvetanov, Plamen V.; Chankov, Dyanko V.; Nikolov, Orlin A.; and Ivanov, Alexander L., 4,513,902, Cl. 228-25.000.
Ives, Donald T.; Madill, Michael J.; and Sliva, Philip G., to Procter & Gamble Company, The. Fabric cleaning/conditioning compositions. 4,514,444, Cl. 427-242.000.
Ivy, William R.: *See*—
Bagnell, Michael J.; and Ivy, William R., 4,514,640, Cl. 250-517.100.
Iwao Jiki Kogyo Kabushiki Kaisha: *See*—
Yamaguchi, Masaharu, 4,513,941, Cl. 249-91.000.
Iwasaki, Masaru: *See*—
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katunobu, 4,514,042, Cl. 350-331.00R.
Iwata, Fumio: *See*—
Nakai, Mamoru; Iwata, Fumio; and Inoue, Teruhiko, 4,514,571, Cl. 546-306.000.
Iwata, Kazuhide; Shibayama, Shigeki; Hidai, Yutaka; and Oyanagi, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Relational algebra engine. 4,514,826, Cl. 364-900.000.
Iwata, Masatoshi: *See*—
Koitabashi, Takeo; Matsuzaka, Syoji; Hotta, Yuji; and Iwata, Masatoshi, 4,514,491, Cl. 430-567.000.
Iwata, Tetsuya: *See*—
Koyama, Shoichi; and Iwata, Tetsuya, 4,514,776, Cl. 360-121.000.
Iwata, Toshiharu: *See*—
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,513,716, Cl. 123-425.000.
Iwer, Herbert W.: *See*—
Dydyk, Michael; and Iwer, Herbert W., 4,514,707, Cl. 331-107.0SL.
Izawa, Koji: *See*—
Nagato, Hitoshi; Izawa, Koji; and Hirahara, Shuzo, 4,514,738, Cl. 346-76.0PH.
Izu, Masatsugu; and Cannella, Vincent D., to Energy Conversion Devices, Inc. Substrate for photovoltaic devices. 4,514,583, Cl. 136-259.000.
Izu, Masatsugu: *See*—
Nath, Prem; and Izu, Masatsugu, 4,513,684, Cl. 118-718.000.
Izumo, Masatoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of shaping a helical gear. 4,514,119, Cl. 409-60.000.
JAEGER: *See*—
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,513,616, Cl. 73-295.000.
J. Hall Company: *See*—
Russo, Anthony; and Mauthner, Thomas, 4,514,325, Cl. 252-557.000.
Jablonski, Thaddeus M.: *See*—
Koeneman, Robert M.; Miller, Benjamin D.; Jablonski, Thaddeus M.; and Schafer, Albert L., 4,513,892, Cl. 222-235.000.
Jacobs, Pierre: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,514,520, Cl. 502-337.000.
Jacques, Roland; and Dupin, Thierry, to Rhone-Poulenc Specialites Chimiques. Preparation of spheroidal alumina particulates. 4,514,511, Cl. 502-8.000.
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating fungi with novel 5-aryloxy-5-azolyl-3,3-dimethylpent-1-en-4-ones and -ols. 4,514,409, Cl. 514-383.000.
Jalbert, Robert A.; Galcenski, Anthony P., Jr.; and Urmson, Charles C., to Rogers Foam Corporation. Shoe inner sole. 4,513,518, Cl. 36-44.000.
James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,514,366, Cl. 423-318.000.
James River-Norwalk, Inc.: *See*—
Schlesinger, Sheldon I.; Cerenzia, Walter S.; and Wilson, Thomas D., 4,514,354, Cl. 264-324.000.
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, to Commissariat a l'Energie Atomique; and Office National d'Etudes et de Recherche Aerospatiales (ONERA). Process and device for the accelerated densification of a porous carbonaceous substrate by decomposition of a hydrocarbon substance. 4,514,371, Cl. 423-449.000.
Janata, Jiri, to University of Utah. Apparatus and method for measuring the concentration of components in fluids. 4,514,263, Cl. 204-1.00T.
Janda, Jiri; and Hrdlicka, Karel, to Tesla, koncernovy podnik. Arrangement for adjustment of the vertical tracking force on a phonograph stylus. 4,514,838, Cl. 369-254.000.
Janssen, Johannes A.: *See*—
Weterings, Cornelis A. M.; and Janssen, Johannes A., 4,514,365, Cl. 423-15.000.
Janssens, Wilhelmus: *See*—
Lemahieu, Raymond G.; and Janssens, Wilhelmus, 4,514,494, Cl. 430-376.000.
Japan Mining Promotive Foundation, The: *See*—
Goto, Sakichi, 4,514,221, Cl. 75-63.000.
Jarman, Davis R.; and Hinson, Virgil H. Vehicle body and frame measuring device. 4,513,508, Cl. 33-288.000.
Jarvenpaa, Viljo J. Apparatus and method for removing gaseous components and/or solid impurities present in a gaseous fluid flow. 4,514,194, Cl. 55-91.000.
Jautelat, Manfred: *See*—
Jager, Gerhard; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,514,409, Cl. 514-383.000.
Jedo, Antoni: *See*—
Szczesny, Adolf; Kleinert, Reiner; Jedo, Antoni; and Gutorski, Zygmunt, 4,514,300, Cl. 210-342.000.
Jennings, William B.; Shelton, Edward B.; and Hayes, Richmond S., Jr., to Carrier Corporation. Combination compressor support and drain pan. 4,513,586, Cl. 62-263.000.
Jenny, Ernst; Mayer, Andreas; and Moser, Peter, to BBC Brown, Boveri & Company, Limited. Method of supercharging internal combustion engines using exhaust turbochargers with variable exhaust gas swallowing capacity. 4,513,571, Cl. 60-603.000.
Jeno's, Inc.: *See*—
Parson, Roger F.; Rosenquist, Kenneth G.; and Schmit, Justin M., 4,513,918, Cl. 241-101.400.
Jester, Michael H. Illuminated light switch plate with LED and oscillator circuit. 4,514,789, Cl. 362-95.000.
John, Erich; and Pollak-Banda, Erich, to Zahnraderfabrik Renk AG. Hydrodynamic bearing assembly. 4,514,099, Cl. 384-100.000.
Johns, Owen L., to Howmedica, Inc. Wound dressing. 4,513,739, Cl. 128-156.000.
Johnson, Bruce A.; and Wnuk, Andrew J., to Procter & Gamble Company, The. Method of making a foraminous member. 4,514,345, Cl. 264-22.000.
Johnson, Bruce F.: *See*—
Southworth, Glen R.; and Johnson, Bruce F., 4,514,753, Cl. 358-11.000.
Johnson, Charles B., to Combustion Engineering, Inc. Sound suppression system. 4,513,840, Cl. 181-210.000.
Johnson, David E.; and Williams, Richard W., to FRL, Inc. Metal detector and discriminator using differentiation for background signal suppression. 4,514,692, Cl. 324-329.000.
Johnson & Johnson Baby Products Company: *See*—
Murray, William V.; Clum, Charles E.; and Lukenbach, Elvin R., 4,514,383, Cl. 424-59.000.
Johnson, Larry; and Uphoff, Billie J., to Lawrence Brothers, Inc. Barn door framing system. 4,513,554, Cl. 52-657.000.
Johnson, Larry, to Lawrence Brothers, Inc. Barn door framing system. 4,513,555, Cl. 52-657.000.
Johnson, Michael D., to Becton, Dickinson and Company. Slip resistant surfaces. 4,514,460, Cl. 428-245.000.
Johnson, Richard V.; and Turner, William D., to Xerox Corporation. Cross scan beam positioner for multiple channel laser ROS. 4,514,739, Cl. 346-108.000.
Johnson, Robert G.: *See*—
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,514,029, Cl. 339-143.00R.
Johnson, Wade M., Jr.; and Angehrn, Jorg A., to Dresser Industries, Inc. Dynamic range control of electrode pad current in well logging tools. 4,514,809, Cl. 364-422.000.
Johnston, Thomas F., Jr.: *See*—
Witte, Kenneth G.; and Johnston, Thomas F., Jr., 4,514,849, Cl. 372-29.000.
Johnstone, Richard; and Kirkham, Edward E., to Kearney & Trecker Corporation. Adaptive control system for machine tool or the like. 4,514,123, Cl. 409-231.000.
Jolliff, William L. Fishing line release mechanism. 4,513,524, Cl. 43-43.120.
Jones, David E., to Mead Corporation, The. Ink jet printer start-up and shutdown. 4,514,735, Cl. 346-1.100.
Jones, Glyn T.: *See*—
Wall, George W.; and Jones, Glyn T., 4,514,298, Cl. 210-232.000.
Jones, Stephen H.: *See*—
Berthel, Robert O.; Plank, Vernon G.; Jones, Stephen H.; and Matthews, Anthony J., 4,514,758, Cl. 358-93.000.
Jonkeren, Gerrit J.: *See*—
van Zon, Cornelis; Jonkeren, Gerrit J.; and Eggengoor, Hilbert, 4,514,302, Cl. 210-433.200.

Jordan, J. Kirk; and Scherling, Sandra L., to Martha White Foods, Inc. Package and method for the automatic control of the degree of cooking of a cereal. 4,514,426, Cl. 426-113.000.
Josef Willmes GmbH: *See*—
Braun, Oskar, 4,513,659, Cl. 100-117.000.
Josquin, Wilhelmus J. M. J.: *See*—
van Ommen, Alfred H.; Maas, Henricus G. R.; Appels, Johannes A.; and Josquin, Wilhelmus J. M. J., 4,514,251, Cl. 156-628.000.
Jost, Ralph, to Hobas-Engineering AG. Tube coupling. 4,513,996, Cl. 285-110.000.
Jourdain, Charles H.: *See*—
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,513,616, Cl. 73-295.000.
Joy Manufacturing Company: *See*—
Coe, Everett L., Jr., 4,514,195, Cl. 55-152.000.
Saulters, John D.; and Scarr, Roger H., 4,514,796, Cl. 364-142.000.
Justice, Bruce H.; and Aycock, Robert F., to Allied Corporation. Spin-on dopant method. 4,514,440, Cl. 427-85.000.
K. D. Binnie Engineering Pty. Ltd.: *See*—
Binnie, Kevin D., 4,513,487, Cl. 29-243.500.
Kabu, Masahiro: *See*—
Hayashi, Tetsuaki; Kabu, Masahiro; and Yamashita, Nobuyuki, 4,513,834, Cl. 180-70.100.
Kabushiki Kaisha Daini Seikosha: *See*—
Nagasaka, Nobuyuki; and Momoshima, Yukichi, 4,513,650, Cl. 84-1.030.
Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, 4,513,753, Cl. 128-706.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Iida, Shinzo; Ie, Katsuji; and Miyazaki, Jun, 4,513,806, Cl. 164-413.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Edo, Teruo, 4,513,719, Cl. 123-447.000.
Kabushiki Kaisha Nippon Coinco.: *See*—
Mori, Yoshikazu; Kojima, Susumu; and Kobayashi, Osamu, 4,513,880, Cl. 221-260.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; Seiki, Kazuo; and Takasu, Shigeru, 4,513,481, Cl. 19-244.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Shimada, Hisashi; Arai, Tohru; and Endo, Junji, 4,514,275, Cl. 204-298.000.
Kabushiki Kaisha Universal: *See*—
Okada, Tomoo, 4,513,968, Cl. 273-143.00R.
Kadomatsu, Yasuo: *See*—
Matsuura, Tadashi; and Kadomatsu, Yasuo, 4,514,483, Cl. 430-84.000.
Kadono, Motoaki; and Tamura, Shingo, to Toray Silicone Company, Ltd. Water impermeable package for room temperature-moisture curing one-part sealants. 4,514,446, Cl. 428-35.000.
Kadota, Genichi: *See*—
Shinohara, Satoru; Fujii, Noboru; Imada, Kiyohisa; Kadota, Genichi; and Ueno, Hideo, 4,514,560, Cl. 536-1.100.
Kaeufer, Helmut; Rautenberg, Lutz; and Pahl, Joachim, to Deutsche Solvay Werke GmbH. Process for the manufacture of articles of high mechanical strength from thermoplastic synthetic resins. 4,514,351, Cl. 264-210.200.
Kagabu, Shinzo: *See*—
Saito, Junichi; and Kagabu, Shinzo, 4,514,418, Cl. 514-508.000.
Kail, James E.: *See*—
Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., 4,514,552, Cl. 526-301.000.
Kaiser, Emil T.; and Moe, Gregory, to University Patents, Inc. Peptide hormones with calcitonin-like activity. 4,514,331, Cl. 260-112.50T.
Kajumov, Rashid R.: *See*—
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., 4,513,620, Cl. 73-664.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Gmeinder, Hermann; and Wenger, Georg, 4,514,604, Cl. 200-83.00N.
Strohmaier, Ernst, 4,514,169, Cl. 433-29.000.
Kamata, Yuzuru: *See*—
Kanoi, Minoru; Hori, Yasuro; and Kamata, Yuzuru, 4,514,714, Cl. 336-100.000.
Kaminsky, Theo, to Santrade Ltd. Drive mechanism for radial adjustment of a drilling tool. 4,514,116, Cl. 408-161.000.
Kamio, Takayoshi: *See*—
Seto, Nobuo; Kamio, Takayoshi; and Aoki, Kozo, 4,514,490, Cl. 430-505.000.
Kamleitner, Ewald, to MTU Motoren und Turbinen-Union Friedrichshafen GmbH. Fuel injection timer. 4,513,724, Cl. 123-500.000.
Kamo, Takashi: *See*—
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.
Kamyr AB: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,513,515, Cl. 34-33.000.
Kanagawa Chemical Laboratory, Ltd.: *See*—
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, 4,514,419, Cl. 514-521.000.
Kanars Data Corporation: *See*—
Matumoto, Hiroaki; and Sekiguchi, Hiroshi, 4,514,675, Cl. 318-696.000.
Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, 4,514,328, Cl. 252-609.000.
Kanebako, Hiromu; and Hisatomi, Yasukiro, to Kuroda Precision Industries Ltd. Cutting fluid supply apparatus. 4,514,149, Cl. 417-403.000.
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, to Murata Manufacturing Co., Ltd. Electronic component series. 4,514,787, Cl. 361-420.000.
Kanne, David B.: *See*—
Heather, James B.; and Kanne, David B., 4,514,215, Cl. 71-107.000.
Kanoi, Minoru; Hori, Yasuro; and Kamata, Yuzuru, to Hitachi, Ltd. Noise-reduction device for stationary induction apparatus. 4,514,714, Cl. 336-100.000.
Kansai Paint Co., Ltd.: *See*—
Sugimoto, Kenji; and Isozaki, Osamu, 4,514,471, Cl. 428-703.000.
Kanzaki Paper Manufacturing Co. Ltd.: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.
Kariatsumari, Keiichiro; and Hirai, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave power amplifier/combiner. 4,514,699, Cl. 330-53.000.
Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos Yhtyma Oy. Substituted imidazole derivatives and their use as anti-thrombosis agents. 4,514,412, Cl. 514-397.000.
Karlsberg, Jerry J. Credit card hair comb. 4,513,842, Cl. 132-11.00R.
Karlsson, Hakan I.; and Pettersson, Jan G. T., to Svenska Traforskningsinstitutet. Method of measuring fines in pulp suspensions. 4,514,257, Cl. 162-49.000.
Kasagi, Kunisuke; and Kawashima, Machio, to Hitachi, Ltd. Color television receiver. 4,514,664, Cl. 315-383.000.
Kasai, Junichi: *See*—
Yanagishima, Takayuki; and Kasai, Junichi, 4,514,599, Cl. 179-181.00W.
Kasai, Kazumi, to Yoshida Kogyo K. K. Slide fastener stringer. 4,513,483, Cl. 24-409.000.
Kashiwagi, Susumu: *See*—
Sasaki, Masafumi; Kashiwagi, Susumu; and Hiyoshi, Takanori, 4,513,569, Cl. 60-39.310.
Kaspar, Klaus P.; Becker, Jurgen; and Huber, Marion, to Boehringer Mannheim GmbH. Container assembly for viscous test specimen materials. 4,514,091, Cl. 366-130.000.
Kaspers, Helmut: *See*—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,514,402, Cl. 514-250.000.
Kastalsky, Alexander: *See*—
Bean, John C.; Kastalsky, Alexander; and Luryi, Sergey, 4,514,748, Cl. 357-58.000.
Kastner, Anton: *See*—
Wevelsiep, Klaus; and Kastner, Anton, 4,514,622, Cl. 235-463.000.
Kasuya, Takahira; Morita, Hideaki; Takagiwa, Hiroyuki; and Yamakawa, Goichi, to Konishiroku Photo Industry Co., Ltd. Method for manufacturing toner for electrophotography. 4,514,487, Cl. 430-137.000.
Kataoka, Kenji: *See*—
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, 4,514,079, Cl. 355-8.000.
Kato, Kenshiro: *See*—
Togashi, Minoru; Kato, Kenshiro; and Furuya, Shin-ichi, 4,513,802, Cl. 152-353.00R.
Kaufman, George A., III; and Kocher, Mark J., to General Electric Company. Two stage electrical braking for a variable speed AC induction motor. 4,514,677, Cl. 318-759.000.
Kawabuchi, Katsuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of making improved aluminum metallization in self-aligned polysilicon gate technology. 4,514,233, Cl. 148-1.500.
Kawaguchi, Yoshikazu; Maruyama, Seiichro; and Kawasaki, Hiroyuki, to Mitsubishi Chemical Industries, Limited. Production of molded articles having excellent optical characteristics. 4,514,357, Cl. 264-328.160.
Kawai, Hisasi: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, 4,513,626, Cl. 73-862.340.
Kawai, Mituo: *See*—
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,513,651, Cl. 84-1.220.
Kawai, Tohru, to Canon Kabushiki Kaisha. Lens mounting. 4,514,039, Cl. 350-255.000.
Kawai, Toshinori: *See*—
Imoda, Kinichiro; Kawai, Toshinori; and Nishitani, Kimio, 4,513,921, Cl. 242-36.000.
Kawakami, Ken-ichi: *See*—
Tanaka, Kazuhiro; Kawakami, Ken-ichi; and Yoshii, Toshiya, 4,514,452, Cl. 428-141.000.
Kawakami, Yukichika: *See*—
Shiiki, Zenya; Iizuka, Yo; and Kawakami, Yukichika, 4,514,558, Cl. 528-388.000.

Kawakita, Kenji: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.

Kawakita, Shizuo; Shibazaki, Takeyoshi; and Mochida, Hiromi, to Mitsubishi Kinzoku Kabushiki Kaisha. Continuous direct process of lead smelting. 4,514,223, Cl. 75-77.000.

Kawakita, Takeshi: *See*—
Tashiro, Chiaki; Kawakita, Takeshi; Horii, Ichiro; and Anami, Koretake, 4,514,403, Cl. 514-274.000.

Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; and Kawamura, Hideaki, 4,514,813, Cl. 364-474.000.

Kawasaki, Hiroyuki: *See*—
Kawaguchi, Yoshikazu; Maruyama, Seiichro; and Kawasaki, Hiroyuki, 4,514,357, Cl. 264-328.160.

Kawasaki, Masahiro: *See*—
Negishi, Kiyoshi; Kawasaki, Masahiro; and Tano, Eiichi, 4,514,075, Cl. 354-446.000.

Kawase, Shigeki: *See*—
Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, 4,514,451, Cl. 428-141.000.

Kawase, Yozo: *See*—
Inagaki, Taizo; Ichikawa, Kentaro; Kido, Hitoshi; and Kawase, Yozo, 4,514,138, Cl. 415-1.000.

Kawashima, Machio: *See*—
Kasagi, Kunisuke; and Kawashima, Machio, 4,514,664, Cl. 315-383.000.

Kawata, Ken: *See*—
Hirai, Hiroyuki; Sato, Kozo; and Kawata, Ken, 4,514,493, Cl. 430-617.000.

Kaye, Wilbur I., to Beckman Instruments, Inc. Marking and authenticating documents with liquid crystal materials. 4,514,085, Cl. 356-71.000.

Kazansky Aviatsionny Institut Imeni A. N. Tupoleva: *See*—
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., 4,513,620, Cl. 73-664.000.
Uretsky, Yan S., 4,513,622, Cl. 73-664.000.

KB Cold Isostatic Press Systems CIPS: *See*—
Pettersson, Ola, 4,514,158, Cl. 425-78.000.

Kear, Bernard H.: *See*—
Giamei, Anthony F.; and Kear, Bernard H., 4,514,360, Cl. 420-454.000.

Kearney & Trecker Corporation: *See*—
Johnstone, Richard; and Kirkham, Edward E., 4,514,123, Cl. 409-231.000.

Kearns, Chester L., to Montgomery Hosiery Mill, Inc. Sock with simulated lace edge and method. 4,513,589, Cl. 66-180.000.

Keddie, David P.; and Shaw, Richard J., to Hempe Manufacturing Co. Water-powered brush. 4,513,466, Cl. 15-29.000.

Keen, William E., Jr.: *See*—
Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., 4,514,307, Cl. 210-751.000.

Keese, Richard C.: *See*—
Giaever, Ivar; and Keese, Richard C., 4,514,500, Cl. 435-241.000.

Keilberth, Richard: *See*—
Aldinger, Fritz; Bischoff, Albrecht; Keilberth, Richard; and Sperner, Franz, 4,514,589, Cl. 174-119.00R.

Keller, William F.; and Sibley, Richard D., to Koso International, Inc. Shock responsive device. 4,513,629, Cl. 74-2.000.

Kellerman, Anne S.: *See*—
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.

Kelly, Stephen M.: *See*—
Tuong, Huynh-Ba; Kelly, Stephen M.; and Osman, Maged A., 4,514,317, Cl. 252-299.620.

Kemp, Linwood B.: *See*—
Layman, Robert G.; and Kemp, Linwood B., 4,514,294, Cl. 210-87.000.

Kendall Company, The: *See*—
Westlake, Betsy C., 4,513,740, Cl. 128-165.000.

Kenny, Andrew A., to Eaton Corporation. Controlling engine idle. 4,513,785, Cl. 137-881.000.

KenoGard AB: *See*—
Swiatkowski, Piotr; and Wiklund, Thomas, 4,514,290, Cl. 209-166.000.

Kent, William C., to AT&T Technologies, Inc. Methods and apparatus for simultaneously inserting an array of flexible pins into a work piece. 4,513,498, Cl. 29-845.000.

Kenzie, E. Dennis, to Aero-Safe Technologies Inc. Dereefing cutter. 4,513,931, Cl. 244-152.000.

Kerner, Dieter; Kleinschmit, Peter; Parkhouse, Alan; and Wolff, Siegfried, to Degussa Aktiengesellschaft. Natural oxidic or silicate filler modified on the surface, a process for its production. 4,514,231, Cl. 106-309.000.

Kernforschungsanlage Julich Gesellschaft Mit Beschrankter Haftung: *See*—
Luhleich, Hartmut; and Dias, Francisco J., 4,514,346, Cl. 264-29.500.
Ringel, Helmut; Zimmer, Erich; and Abdelmonem, Nabil, 4,514,296, Cl. 210-96.100.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Ehrfeld, Wolfgang; and Krieg, Gunther, 4,514,095, Cl. 366-340.000.

Kerotest Manufacturing Corp.: *See*—
Owoc, James R.; Thomas, John H.; and Conley, Richard W., 4,513,779, Cl. 137-556.000.

Kesling, Haven S., Jr., to Atlantic Richfield Company. Production of aryl alkyl ethers from methylbenzyl alcohol using rhenium heptoxide catalyst. 4,514,576, Cl. 568-659.000.

Ketels, Gerardus H. J., to Procom, B.V. Method for removing solid particles from a pasty mass. 4,513,477, Cl. 17-46.000.

Kettlewell, Peter J.: *See*—
Berry, Paul S.; Benson, John A.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,513,689, Cl. 119-82.000.

Kettman, John R.; and Norgard, Michael V., to Board of Regents, The University of Texas System, The. Hybrid cell lines producing monoclonal antibodies directed against Treponema. 4,514,498, Cl. 435-240.000.

Kido, Hitoshi: *See*—
Inagaki, Taizo; Ichikawa, Kentaro; Kido, Hitoshi; and Kawase, Yozo, 4,514,138, Cl. 415-1.000.

Kikkoman Corporation: *See*—
Matsuura, Masaru, 4,514,433, Cl. 426-634.000.

Kikuchi, Junzo; Sugiura, Ryuzo; Yamamoto, Mutsuhiro; and Yoshida, Toshiro, to Tamura Electric Works, Ltd. Control of a key telephone system using a pulse width modulated signal. 4,514,597, Cl. 179-99.00M.

Kikuchi, Yoshiki: *See*—
Saitoh, Hiroyuki; and Kikuchi, Yoshiki, 4,514,744, Cl. 346-153.100.

Kikushima, Kazuyuki: *See*—
Kubota, Yasuo; Tanaka, Kazuhiko; and Kikushima, Kazuyuki, 4,514,767, Cl. 358-280.000.

Kikuta, Kazutsune: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,514,513, Cl. 502-112.000.

Killen, Robert H., to Gravity Guidance, Inc. Toggle bar for exercise and health purposes. 4,513,961, Cl. 272-62.000.

Kim, George A.: *See*—
Verma, Surendra K.; and Kim, George A., 4,514,192, Cl. 51-295.000.

Kimberlin, Dan W., to General Electric Company. Contact and terminal assembly for a brush wear indicator. 4,513,495, Cl. 29-597.000.

Kimoto, Manabu, to Nippon Electric Co., Ltd. Information handling apparatus having a high speed instruction-executing function. 4,514,804, Cl. 364-200.000.

Kimoto, Tetsuo; and Orita, Kiyoshi, to Nippon Steel Corporation. Apparatus for reducing the watt loss of a grain-oriented electromagnetic steel sheet. 4,513,597, Cl. 72-53.000.

Kimura, Hiroshi: *See*—
Minami, Shunji; and Kimura, Hiroshi, 4,513,725, Cl. 123-511.000.

Kimura, Shirou: *See*—
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.

Kimura, Takashi; Mochiji, Kozo; and Obayashi, Hidehito, to Hitachi, Ltd. X-Ray lithographic system. 4,514,857, Cl. 378-034.000.

Kimura, Yoshiharu: *See*—
Taniguchi, Isoji; and Kimura, Yoshiharu, 4,514,555, Cl. 528-9.000.

Kindt, Robert J., to Eastman Kodak Company. Sheet deceleration apparatus. 4,513,959, Cl. 271-270.000.

Kinex Corporation: *See*—
Nordling, Karl I., 4,514,825, Cl. 364-900.000.

King, James D.: *See*—
De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., 4,514,691, Cl. 324-301.000.

King, Monroe L., to Eaton Corporation. Ion treatment apparatus. 4,514,636, Cl. 250-443.100.

Kinney, Ohler L., Jr.; and Holmberg, Joyce D., to Marley Cooling Tower Company, The. Air stream entrained water eliminator for cross flow cooling tower. 4,514,202, Cl. 55-440.000.

Kino, Gordon S.; Bennett, Simon D.; and Husson, Didier, to Leland Stanford University, Board of Trustees of. Three-dimensional temperature probe. 4,513,749, Cl. 128-660.000.

Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., to Polaroid Corporation. Photographic sheet processor having large diameter rolling surfaces. 4,514,069, Cl. 354-304.000.

Kirkham, Edward E.: *See*—
Johnstone, Richard; and Kirkham, Edward E., 4,514,123, Cl. 409-231.000.

Kirsch, Warren B., to Ethyl Corporation. Metal bromide preparation. 4,514,374, Cl. 423-497.000.

Kisida, Hirosi: *See*—
Ohsumi, Tadashi; Hatakoshi, Makoto; and Kisida, Hirosi, 4,514,406, Cl. 514-352.000.

Kisler, Semyon, to Polaroid Corporation. Coating uniformity improvement apparatus. 4,513,683, Cl. 118-620.000.

Kit, Malon; and Kit, Saul, to Novagene, Ltd.; and Baylor College of Medicine. Modified live pseudorabies viruses. 4,514,497, Cl. 435-235.000.

Kit, Saul: *See*—
Kit, Malon; and Kit, Saul, 4,514,497, Cl. 435-235.000.

Kita, Yukio; Koide, Kazuo; and Horiko, Kouki, to Oji Paper Company, Ltd. Method for cultivation of microorganism. 4,514,501, Cl. 435-251.000.

Kitahara, Akifumi: *See*—
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, 4,514,395, Cl. 514-224.000.

Kitajima, Hisashi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.
Kitani, Masakatsu: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.
Kittel, Ludwig: *See*—
Bader, Edgar; Rohrbach, Gerd; Petersen, Jurgen; and Kittel, Ludwig, 4,514,840, Cl. 370-29.000.
Klaschka, Rudolf. Capacitor can housing, process and apparatus for its manufacture. 4,513,873, Cl. 220-89.00A.
Klaschka, Rudolf; and Wolf, Franz J. Composite cover plate and application of the same. 4,514,788, Cl. 361-433.000.
Klaue, Kaj, to Synthes AG. Surgical compression plate. 4,513,744, Cl. 128-92.00D.
Klaus, Dale A., to International Export Company. Lighting fixture with triple insulating means. 4,514,792, Cl. 362-294.000.
Kleeb, Linda L.: *See*—
Kleeb, Thomas R.; and Kleeb, Linda L., 4,514,531, Cl. 524-5.000.
Kleeb, Thomas R.; and Kleeb, Linda L., to Dresser Industries, Inc. Monolithic refractories comprising a hydrocolloid. 4,514,531, Cl. 524-5.000.
Kleinberg, Roger: *See*—
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,094, Cl. 366-160.000.
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,431, Cl. 426-641.000.
Kleinert, Reiner: *See*—
Szczesny, Adolf; Kleinert, Reiner; Jedo, Antoni; and Gutorski, Zygmunt, 4,514,300, Cl. 210-342.000.
Kleinschmit, Peter: *See*—
Kerner, Dieter; Kleinschmit, Peter; Parkhouse, Alan; and Wolff, Siegfried, 4,514,231, Cl. 106-309.000.
Klepner, Stephen P., to International Business Machines Corporation. Groundplane post-etch anodization. 4,514,254, Cl. 156-656.000.
Klimeck, Edward F.: *See*—
Ackerman, Walter T.; and Klimeck, Edward F., 4,514,102, Cl. 401-78.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Eckert, Rolf, 4,513,703, Cl. 123-193.0CH.
KMK Karl Magerle Lizenz AG: *See*—
Magerle, Karl, 4,514,159, Cl. 425-125.000.
Knapp, Caroline M.: *See*—
Knapp, Frank W.; and Knapp, Caroline M., 4,513,500, Cl. 29-885.000.
Knapp, Frank W.; and Knapp, Caroline M. Method of forming a wire splice. 4,513,500, Cl. 29-885.000.
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., to Australasian Training Aids (PTY.) Limited. Firing range. 4,514,621, Cl. 235-400.000.
Knopf, Franz, to List, Hans. Axial fan. 4,514,140, Cl. 415-119.000.
Knowles, James. Corrugated staple. 4,514,126, Cl. 411-477.000.
Kobayashi, Masao, to Shinsei Kogyo Co., Ltd. Cassette-type power unit for a motor toy. 4,514,477, Cl. 429-98.000.
Kobayashi, Nobuyuki; Ito, Hiroshi; and Ohkawa, Nobuhisa, to Toyota Jidosha Kabushiki Kaisha. Engine idling rotational speed control device. 4,513,710, Cl. 123-339.000.
Kobayashi, Osamu: *See*—
Mori, Yoshikazu; Kojima, Susumu; and Kobayashi, Osamu, 4,513,880, Cl. 221-260.000.
Kobayashi, Takehiro: *See*—
Tsunoda, Kikuo; and Kobayashi, Takehiro, 4,513,926, Cl. 242-84.20G.
Kobayashi, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Ignition timing control device of an internal combustion engine. 4,513,717, Cl. 123-425.000.
Kober, Alfred E.; and Gilewicz, Stanley E. Method of minimizing slagging in the burning of black liquid. 4,514,256, Cl. 162-30.110.
Koch Adler AG: *See*—
Scholl, Hans, 4,513,677, Cl. 112-262.300.
Koch, Albin G., to Heierling of Switzerland, Ltd. Ski boot with inner boot tightening mechanism. 4,513,520, Cl. 36-119.000.
Kocher, Mark J.: *See*—
Kaufman, George A., III; and Kocher, Mark J., 4,514,677, Cl. 318-759.000.
Kochs Adler AG: *See*—
Meyer, Horst; and Landwehr, Gunter, 4,513,675, Cl. 112-236.000.
Koci, Zdenek: *See*—
Lauton, Alain; and Koci, Zdenek, 4,514,186, Cl. 8-527.000.
Koeneman, Robert M.; Miller, Benjamin D.; Jablonski, Thaddeus M.; and Schafer, Albert L., to Remcor Products Company. Flaked ice dispenser. 4,513,892, Cl. 222-235.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Schneider, Georg, 4,513,662, Cl. 101-207.000.
Koerner, Dennis W.: *See*—
Glass, Richard W.; and Koerner, Dennis W., 4,514,428, Cl. 426-321.000.
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,513,702, Cl. 123-193.00H.
Kogen, James; and Anderson, C. Roger, to Shure Brothers, Inc. Brush contact for phonograph tone arm dynamic stabilizer. 4,514,836, Cl. 369-74.000.
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Torque detector. 4,513,627, Cl. 73-862.340.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, to Nippon Soken, Inc.; and Nippondenso Co., Inc. Torque detector. 4,513,628, Cl. 73-862.340.
Kohama, Tokio: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, 4,513,626, Cl. 73-862.340.
Kohler Coating Machinery Corporation, The: *See*—
Kohler, Gordon A. E.; Kohler, John B.; and Kohler, Herbert B., 4,513,915, Cl. 239-455.000.
Kohler, Gordon A. E.; Kohler, John B.; and Kohler, Herbert B., to Kohler Coating Machinery Corporation, The. Nozzle construction for coating equipment. 4,513,915, Cl. 239-455.000.
Kohler, Herbert B.: *See*—
Kohler, Gordon A. E.; Kohler, John B.; and Kohler, Herbert B., 4,513,915, Cl. 239-455.000.
Kohler, John B.: *See*—
Kohler, Gordon A. E.; Kohler, John B.; and Kohler, Herbert B., 4,513,915, Cl. 239-455.000.
Kohler, Richard B.; and White, Arthur C., to Indiana University Foundation. Method for the diagnosis of Legionnaires' disease. 4,514,509, Cl. 436-518.000.
Kohlstette, Werner, to Westfalia Separator AG. Centrifuge with self-emptying drum. 4,514,183, Cl. 494-27.000.
Koide, Kazunari: *See*—
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.
Koide, Kazuo: *See*—
Kita, Yukio; Koide, Kazuo; and Horiko, Kouki, 4,514,501, Cl. 435-251.000.
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, to Hitachi, Ltd. Solid-state imaging device. 4,514,766, Cl. 358-213.000.
Koitabashi, Takeo; Matsuzaka, Syoji; Hotta, Yuji; and Iwata, Masatoshi, to Konishiroku Photo Industry Co., Ltd. Photosensitive silver halide emulsion. 4,514,491, Cl. 430-567.000.
Koivunen, Erkki A., to General Motors Corporation. Dual input clutch transmission. 4,513,631, Cl. 74-360.000.
Koivunen, Erkki A.: *See*—
Borman, August H.; and Koivunen, Erkki A., 4,514,147, Cl. 417-288.000.
Koizumi, Hideo: *See*—
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Kojima, Junpei: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
Kojima, Susumu: *See*—
Mori, Yoshikazu; Kojima, Susumu; and Kobayashi, Osamu, 4,513,880, Cl. 221-260.000.
Kojima, Teiryo: *See*—
Negishi, Takao; and Kojima, Teiryo, 4,513,565, Cl. 57-236.000.
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, to Laurel Bank Machine Co., Ltd. Device for swinging accumulating wheel for use in automatic money depositing and disbursing machine. 4,513,958, Cl. 271-187.000.
Koletzki, Ulrich: *See*—
Papst, Georg; Wrobel, Guenter; and Koletzki, Ulrich, 4,513,812, Cl. 165-80.00B.
Komatsu, Yasuhiro: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.
Komeya, Katsutoshi: *See*—
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.
Komoda, Yoshiyuki: *See*—
Suzuki, Yoshiharu; Fukagawa, Hitoshi; Komoda, Yoshiyuki; and Tanaka, Osamu, 4,514,719, Cl. 340-310.00R.
Kondo, Kiyosi: *See*—
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, 4,514,419, Cl. 514-521.000.
Kondo, Ryuji: *See*—
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, 4,514,830, Cl. 365-200.000.
Kondo, Takashi: *See*—
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Kondo, Yoshiaki: *See*—
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Konig, Reinhard. Diaphragm regulating valve. 4,513,948, Cl. 251-212.000.

Koninger, Horst; Lehnert, Klaus; and Schirk, Gunter, to AGFA Gevaert Aktiengesellschaft. Device for coupling the shafts of transporting units in developing machines or the like. 4,514,071, Cl. 354-320.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kasuya, Takahira; Morita, Hideaki; Takagiwa, Hiroyuki; and Yamakawa, Goichi, 4,514,487, Cl. 430-137.000.
Koitabashi, Takeo; Matsuzaka, Syoji; Hotta, Yuji; and Iwata, Masatoshi, 4,514,491, Cl. 430-567.000.
Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi, Kouichi, 4,514,486, Cl. 430-124.000.
Kono, Hiromichi: *See*—
Cruickshank, Philip A.; DiSanzo, Carmine P.; Kondo, Kiyosi; and Kono, Hiromichi, 4,514,419, Cl. 514-521.000.
Konrath, Karl: *See*—
Braun, Wolfgang; Konrath, Karl; and Schwarz, Manfred, 4,513,715, Cl. 123-383.000.
Koppl Company Inc.: *See*—
Coker, Melvin D.; and Wegner, John W., 4,513,788, Cl. 138-89.000.
Kosak, Wolfgang: *See*—
Gassler, Hermann; and Kosak, Wolfgang, 4,513,712, Cl. 123-339.000.
Koski, Erkki, to Valmet Oy. Headbox for a paper machine. 4,514,259, Cl. 162-343.000.
Koso International, Inc.: *See*—
Keller, William F.; and Sibley, Richard D., 4,513,629, Cl. 74-2.000.
Kostecki, Gene. Coating internal surfaces of curved conduits. 4,514,443, Cl. 427-230.000.
Kotcharian, Michel, to Technigaz. Method of building a reservoir for storing a liquid at low temperature. 4,513,550, Cl. 52-249.000.
Kotthaus, Erich, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method for fabricating gears. 4,514,118, Cl. 409-26.000.
Koumura, Takashi; and Nakajima, Toyohei, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling operating amounts of operation control means for an internal combustion engine. 4,513,713, Cl. 123-339.000.
Kowalczyk, Annette: *See*—
Gage, Clifford H., 4,513,901, Cl. 227-49.000.
Koyama, Hiroyasu: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.
Koyama, Shoichi; and Iwata, Tetsuya, to Alps Electric Co., Ltd. Magnetic head and method of manufacturing the same. 4,514,776, Cl. 360-121.000.
Kraft, Inc.: *See*—
Gething, Frank; and Glenn, Edward P., 4,513,533, Cl. 47-63.000.
Kramer, Wolfgang: *See*—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,514,402, Cl. 514-250.000.
Kratt, Alfred: *See*—
Braun, Gunter; Kratt, Alfred; and Schleicher, Rolf, 4,513,711, Cl. 123-339.000.
Krautkramer-Branson, Inc.: *See*—
Renzel, Peter; and Kroesen, Klaus, 4,513,621, Cl. 73-631.000.
Kremer, Ross A.; and Saunders, Stephen W., to Mobil Oil Corporation. Ore beneficiation process. 4,514,288, Cl. 209-5.000.
Krieg, Gunther: *See*—
Ehrfeld, Wolfgang; and Krieg, Gunther, 4,514,095, Cl. 366-340.000.
Kroesen, Klaus: *See*—
Renzel, Peter; and Kroesen, Klaus, 4,513,621, Cl. 73-631.000.
Kruger, Hans: *See*—
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,514,043, Cl. 350-341.000.
Krupp Polysius AG: *See*—
Kupper, Detlev, 4,514,170, Cl. 432-106.000.
Kruse, William C. Chuck collet. 4,513,980, Cl. 279-51.000.
Kubo, Masaharu: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, 4,514,766, Cl. 358-213.000.
Kubota, Ltd.: *See*—
Harada, Denzaburo, 4,513,636, Cl. 74-761.000.
Hayashi, Tetsuaki; Kabu, Masahiro; and Yamashita, Nobuyuki, 4,513,834, Cl. 180-70.100.
Kubota, Reiko: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.
Kubota, Takuo: *See*—
Nagamoto, Mitsuki; and Kubota, Takuo, 4,514,711, Cl. 335-243.000.
Kubota, Yasuo; Tanaka, Kazuhiko; and Kikushima, Kazuyuki, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for making masks and/or block copies for printing. 4,514,767, Cl. 358-280.000.
Kucharska, Helena Z.: *See*—
Burton, Thomas M.; and Kucharska, Helena Z., 4,514,523, Cl. 521-85.000.
Kuckelhahn, Kjeld, to Danfoss A/S. Digital control device for an inverse rectifier. 4,514,678, Cl. 318-807.000.
Kudo, Tomio, to Teac Corporation. Device for cleaning the magnetic head of a recorder/reproducer apparatus for use with a magnetic tape cartridge or the like. 4,514,777, Cl. 360-128.000.
Kuehn, Jack W., Sr. Flowable substance container and dispenser. 4,513,875, Cl. 220-214.000.
Kugelman, Michael M., to B. F. Goodrich Company, The. Indirect current monitoring via voltage and impedance monitoring. 4,514,619, Cl. 219-483.000.
Kuhle, Engelbert; Hagemann, Hermann; Paul, Volker; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with new N-sulphenylated allophanates. 4,514,417, Cl. 514-482.000.
Kuhnsman, Alexandra; and Morey, Marian B., to Alexandra Enterpises, Inc. Illuminatable pet leash. 4,513,692, Cl. 119-109.000.
Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., Jr., 4,513,623, Cl. 73-721.000.
Kulkarni, Ravi D.; Goddard, E. Desmond; and Aronson, Michael P., to Union Carbide Corporation. Antifoam composition containing hydrocarbon-silicon copolymer, hydrophobic filler and hydrocarbon oil. 4,514,319, Cl. 252-321.000.
Kuna, Wayne A.: *See*—
Zaruba, John V.; Hanson, Steven P.; Luecke, Beth E.; and Kuna, Wayne A., 4,514,175, Cl. 434-82.000.
Kunkel, Fred: *See*—
Hummel, Peter; and Kunkel, Fred, 4,513,663, Cl. 101-349.000.
Kuo, Wei H. CRT updated method and apparatus for identifying integrated circuit pins. 4,514,028, Cl. 339-113.00R.
Kupper, Detlev, to Krupp Polysius AG. Apparatus for the heat treatment of fine-grained material. 4,514,170, Cl. 432-106.000.
Kuraray Co., Ltd.: *See*—
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, 4,514,459, Cl. 428-229.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Shiiki, Zenya; Iizuka, Yo; and Kawakami, Yukichika, 4,514,558, Cl. 528-388.000.
Kuriyama, Shizuo: *See*—
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, 4,514,395, Cl. 514-224.000.
Kurkela, Kauko O. A.: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,514,412, Cl. 514-397.000.
Kuroda Precision Industries Ltd.: *See*—
Kanebako, Hiromu; and Hisatomi, Yasukiro, 4,514,149, Cl. 417-403.000.
Kurokawa, Koshiro: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,514,740, Cl. 346-139.00R.
Kurosu, Tomio; and Yoshikawa, Yukio, to Copal Company Limited. Electromagnetic shutter. 4,514,064, Cl. 354-234.100.
Kurth, Josef: *See*—
Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, 4,514,449, Cl. 428-76.000.
Kurtz, Anthony D.; and Mallon, Joseph R., Jr., to Kulite Semiconductor Products, Inc. Transducer housing employing crimped leads. 4,513,623, Cl. 73-721.000.
Kurz, Craven H. Orthodontic tool. 4,514,171, Cl. 433-4.000.
Kyle, James C., to Kyle, James C. Method for making terminal assembly for heart pacemaker. 4,514,207, Cl. 65-21.100.
Kyle, James C. Electrical terminal assembly. 4,514,590, Cl. 174-152.0GM.
Kyowa Chemical Industry Co. Ltd.: *See*—
Miyata, Shigeo, 4,514,389, Cl. 424-128.000.
Lafferty, John J.: *See*—
Bondinell, William E.; Lafferty, John J.; and Zirkle, Charles L., 4,514,414, Cl. 514-422.000.
Lagano, Thomas; and Batchelor, William H., to Propane Carburetion Systems, Inc. Process for controlling secondary gas fuel to normally liquid fueled I.C. engine. 4,513,727, Cl. 123-525.000.
Laing, Gordon E.: *See*—
Sumerau, William R.; and Laing, Gordon E., 4,514,200, Cl. 55-368.000.
Laitar, Robert A., to Acme Resin Corporation. Polyisocyanate compositions useful for polyurethane binders. 4,514,316, Cl. 252-182.000.
Lalanne, Bruno: *See*—
Bezard, Jean-Jacques; Jourdain, Charles H.; and Lalanne, Bruno, 4,513,616, Cl. 73-295.000.
Lambert, Ronald F.: *See*—
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,514,069, Cl. 354-304.000.
Landheer, Dolf: *See*—
Plasschaert, Paul E.; Landheer, Dolf; and Cobb, Harold W., 4,514,781, Cl. 361-230.000.
Landsiedel, Horst; and Plum, Hans, to Schering Aktiengesellschaft. Triorganotin acetylsalicylates and biocides containing the same. 4,514,225, Cl. 106-15.050.
Landwehr, Gunter: *See*—
Meyer, Horst; and Landwehr, Gunter, 4,513,675, Cl. 112-236.000.
Lang, Gordon R.; Longstaff, Fred M.; and Lee, Chi H., to Ese Limited. Means and method for reduction of phase jitter. 4,514,855, Cl. 375-97.000.
Langanke, Rolf: *See*—
Molders, Werner; Langanke, Rolf; Sentinger, Egon; and Reuschenbach, Hermann, 4,513,953, Cl. 267-121.000.
Langbein & Engelbracht GmbH & Co. KG: *See*—
Wallstein, Dieter, 4,513,814, Cl. 165-134.00R.
Lange, Gerhard; and Angeli, Giovanni T. Process and apparatus for producing rolls of wire netting. 4,513,924, Cl. 242-67.200.
Langeiri, Michael: *See*—
DeGraaff, Robert; and Langeiri, Michael, 4,513,981, Cl. 280-1.11R.
Langhoff, Josef; and Seipenbusch, Jurgen, to Ruhrkohle AG. Slag removal apparatus. 4,514,191, Cl. 48-77.000.
Langmesser, Otto J., Jr.; and Rees, Richard W. A., to General Motors Corporation. Vertical seat adjuster arrangement for vehicle seats. 4,513,937, Cl. 248-394.000.

Lash, Ronald J., to OMI International Corporation. Zinc electroplating additive concentrate. 4,514,267, Cl. 204-44.200.

Laskowski, Edward L., to Bendix Automation Company. Contact sensing probe for a measuring apparatus. 4,513,507, Cl. 33-169.00R.

LaSpesa, Richard E., to AT&T Teletype Corporation. Mounting apparatus for dot matrix print head. 4,514,100, Cl. 400-55.000.

Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, to Robert Bosch GmbH. Method for igniting lean fuel-air mixtures and an apparatus to perform the method. 4,513,708, Cl. 123-263.000.

Latsch, Reinhard: *See*—
Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, 4,514,656, Cl. 313-11.500.

Lau, Chester P. K. Pocket battery tester. 4,514,695, Cl. 324-437.000.

Laubie, Michel: *See*—
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,398, Cl. 514-245.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, 4,514,399, Cl. 514-241.000.

Laue, Eric G.: *See*—
Stephens, James B.; Yang, Mary M.; and Laue, Eric G., 4,514,278, Cl. 204-430.000.

Laufhutte, Dieter, to Carl Still G.m.b.H. & Co. KG, Firma. Method of recovering sulfur from the hydrogen sulfide contained in coke oven gases. 4,514,375, Cl. 423-573.00G.

Laurel Bank Machine Co., Ltd.: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,513,958, Cl. 271-187.000.

Lauton, Alain; and Koci, Zdenek, to Ciba Geigy Corporation. Aqueous formulations of water-insoluble or sparingly water-soluble dyes and hypophosphite/unsaturated acid teldmer. 4,514,186, Cl. 8-527.000.

Lautzenhiser, Theodore V., to Standard Oil Company (Indiana). Gravity gradiometer and method. 4,513,618, Cl. 73-382.00G.

Lauver, Richard W., to United States of America, National Aeronautics and Space Administration. Chemical control of nadimide cure temperature and rate. 4,514,557, Cl. 528-342.000.

Law, Denny B.; and Goettker, Bernhardt P., to Unique Functional Products. Trailer with ramp. 4,514,132, Cl. 414-537.000.

Lawrence Brothers, Inc.: *See*—
Johnson, Larry; and Uphoff, Billie J., 4,513,554, Cl. 52-657.000.
Johnson, Larry, 4,513,555, Cl. 52-657.000.
Uphoff, Billie J., 4,513,535, Cl. 49-409.000.

Lawrence, George J., to AMP Incorporated. Contact element. 4,514,032, Cl. 339-278.00C.

Lawrenson, Jack; and Murphy, Kevin M., to Pilkington Brothers P.L.C. Treatment of coated glass. 4,513,543, Cl. 51-283.00R.

Lawson, Peter J., to Cambridge Instruments Limited. Electron beam focussing. 4,514,634, Cl. 250-397.000.

Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, to Quintec Interconnect Systems. Shielded connector and method of forming same. 4,514,029, Cl. 339-143.00R.

Layman, Robert G.; and Kemp, Linwood B., to Layman, Robert G.; and Kemp, Linwood B. Apparatus for decontaminating hydrocarbons containing PCB. 4,514,294, Cl. 210-87.000.

Leach, John M. Conveyor linkage. 4,513,857, Cl. 198-716.000.

Leal, David T. Method and apparatus for depicting inoperative electrical fuses. 4,514,723, Cl. 340-638.000.

Le Coent, Jean-Louis, to Orogil. High alkalinity sulfurized alkylphenates of alkaline earth metals and method of making same. 4,514,313, Cl. 252-42.700.

Ledgerwood, Harry J., to Plessey Incorporated. Stock feeder with adjustable width feed path. 4,513,899, Cl. 226-141.000.

Lee, Chi H.: *See*—
Lang, Gordon R.; Longstaff, Fred M.; and Lee, Chi H., 4,514,855, Cl. 375-97.000.

Lee, Ching-Pang, to General Electric Company. Angled turbulence promoter. 4,514,144, Cl. 416-96.00R.

Lee, John Y.; and Bauer, Dennis P., to Ethyl Corporation. Process for preparing tertiary phosphines. 4,514,575, Cl. 568-17.000.

Lee, Jong S. Combined storing and slicing device for a stick of butter or margarine or the like. 4,513,501, Cl. 30-115.000.

Lee, Peter F., to Southland Instruments, Inc. Biopsy and aspiration unit with a replaceable cannula. 4,513,754, Cl. 128-753.000.

Lee, Robert S.; and Scowen, Reginald V., to Lever Brothers Company. Fabric washing process and detergent composition for use therein. 4,514,185, Cl. 8-137.000.

Lee, Shih-Ying; and Briefer, Dennis K., to Setra Systems, Inc. Weighing system. 4,513,831, Cl. 177-189.000.

Legg, Ernest L.: *See*—
Federico, Anthony M.; Legg, Ernest L.; and Nguyen, Tuan A., 4,514,846, Cl. 371-16.000.

Leggett & Platt, Incorporated: *See*—
McIntire, Darrell L., 4,513,460, Cl. 5-13.000.

Legille, Edouard; Mailliet, Pierre; and Lonardi, Emile, to Paul Wurth S.A. Furnace charging installation. 4,514,129, Cl. 414-200.000.

Lehner AG: *See*—
Castagnola, Virginio; Frigerio, Giuliano E.; and Pellicciari, Roberto, 4,514,393, Cl. 260-397.100.

Lehnert, Klaus: *See*—
Koninger, Horst; Lehnert, Klaus; and Schirk, Gunter, 4,514,071, Cl. 354-320.000.

Leigh, Antony W.: *See*—
Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., 4,514,801, Cl. 364-200.000.

Leitch, William J.: *See*—
Dover, Donald L.; and Leitch, William J., 4,513,994, Cl. 248-544.000.

Leland Stanford University, Board of Trustees of: *See*—
Kino, Gordon S.; Bennett, Simon D.; and Husson, Didier, 4,513,749, Cl. 128-660.000.

Lemahieu, Raymond G.; and Janssens, Wilhelmus, to Agfa-Gevaert N.V. Photographic color material incorporating developing agents for color development. 4,514,494, Cl. 430-376.000.

Lenke, Dieter: *See*—
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.

Lenkoff, Leon G., to Stry-Lenkoff Co. Invisible ink quiz game. 4,514,177, Cl. 434-328.000.

Lentz, James M., to North American Philips Corporation. Video game hand controller. 4,514,600, Cl. 200-5.00R.

Leoffler, Hermann, to BASF Aktiengesellschaft. Monoazo pyridone colorants. 4,514,226, Cl. 106-23.000.

Leon, Joseph A., Jr.; and Caprino, Joseph C., to General Electric Company. Fire-resistant plenum cable and method for making same. 4,514,466, Cl. 428-383.000.

Le Pennec, Claude: *See*—
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,514,371, Cl. 423-449.000.

Lerche, Horst-Dieter: *See*—
Schmidtlein, Hubertus; and Lerche, Horst-Dieter, 4,514,733, Cl. 343-5.0MM.

Lesche, Wolfgang; and Rindfleisch, Volker, to Siemens Aktiengesellschaft. Electrical control apparatus. 4,514,798, Cl. 364-188.000.

Leslie, Peter C. Flexible insulative carrier. 4,513,895, Cl. 224-151.000.

Lesniak, Thomas A., to Ex-Cell-O Corporation. Heat exchanger. 4,513,811, Cl. 165-79.000.

Lestraden, Jacobus W., to Schulte & Lestraden B.V. Method and device for growing products. 4,513,531, Cl. 47-39.000.

LeStrange, Raymond J.; Bayless, John H., Jr.; and Schoenberg, Allan R., to Du Pont de Nemours, E. I., and Company. Elimination of defects in cysteine-sensitized emulsions. 4,514,492, Cl. 430-600.000.

Lever Brothers Company: *See*—
Cook, Norman, 4,513,914, Cl. 239-121.000.
Lee, Robert S.; and Scowen, Reginald V., 4,514,185, Cl. 8-137.000.

Liebe, Reinhard: *See*—
Wochnowski, Waldemar; Hohm, Reinhard; Liebe, Reinhard; and Muss, Manfred, 4,513,759, Cl. 131-303.000.

Liebel, Henry L., to Signode Paper Products Company. Interior core protector. 4,513,864, Cl. 206-396.000.

Lin, Hong-Pei. Chess box. 4,513,974, Cl. 273-239.000.

Lincke, Paul, to Sulzer Brothers Limited. Weft yarn tensioning device. 4,513,792, Cl. 139-439.000.

Lindblom, Thore; Hedin, Jan-Erik; and Wickstrom, Sven, to Ostbergs Fabriks AB. Method of cutting substantially horizontal cantilevered objects such as logs, and apparatus for carrying out the method. 4,513,799, Cl. 144-379.000.

Linder, Ernst: *See*—
Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, 4,514,656, Cl. 313-11.500.

Lindquist, James R.: *See*—
Brown, William M.; and Lindquist, James R., 4,514,594, Cl. 179-2.510.

Lionnet, Richard, to Raychem Pontoise, S. A. Recoverable article. 4,514,031, Cl. 339-205.000.

Lipschitz, Barry. Method and means for producing yarn. 4,514,349, Cl. 264-103.000.

Lischke, Burkhard; Frosien, Juergen; Anger, Klaus; and Plies, Erich, to Siemens Aktiengesellschaft. Electron-optical system with variable-shaped beam for generating and measuring microstructures. 4,514,638, Cl. 250-492.200.

List, Hans: *See*—
Knopf, Franz, 4,514,140, Cl. 415-119.000.

Littauer, Ernest L.: *See*—
Momyer, William R.; and Littauer, Ernest L., 4,514,474, Cl. 429-27.000.

Lloyd, Harold; and Slinn, David S. L., to Electricity Council, The. Electrical circuit interrupting devices. 4,514,607, Cl. 200-150.00A.

Lo, Ching P., to Amerosa Enterprises, Inc. Clutch brake assembly for rotary lawnmower. 4,513,848, Cl. 192-18.00R.

Lockheed Missiles & Space Company, Inc.: *See*—
Momyer, William R.; and Littauer, Ernest L., 4,514,474, Cl. 429-27.000.

Loctite Corporation: *See*—
Beers, Melvin D.; and Thompson, James E., 4,514,529, Cl. 523-200.000.

Lodwig, Klaus; and Schefers, Friedhelm, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Power and liquid supply system for mining machines. 4,514,011, Cl. 299-42.000.

Loersch, Joseph F.; and Neal, James W., to United Technologies Corporation. Peened overlay coatings. 4,514,469, Cl. 428-553.000.

LOF Plastics Inc.: *See*—
Guy, Robert R., 4,514,003, Cl. 293-128.000.

Lonardi, Emile: *See*—
Legille, Edouard; Mailliet, Pierre; and Lonardi, Emile, 4,514,129, Cl. 414-200.000.

Long, Wallace H.; and Ruggiero, Ralph, to Duval Corporation. Conveyor with readily replaceable roller. 4,513,859, Cl. 198-842.000.

Longstaff, Fred M.: *See*—
Lang, Gordon R.; Longstaff, Fred M.; and Lee, Chi H., 4,514,855, Cl. 375-97.000.
Longsworth, Ralph C.: *See*—
Bonney, Glenn E.; and Longsworth, Ralph C., 4,514,204, Cl. 62-41.000.
Lord Corporation: *See*—
Thorn, Richard P.; and Gupta, Bhagwati P., 4,514,458, Cl. 428-222.000.
L'Oreal: *See*—
Goncalves, Antonin L., 4,513,890, Cl. 222-153.000.
Loseries, Peter, to Ernst Leitz Wetzler GmbH. Photographic camera. 4,514,076, Cl. 354-481.000.
Losinger, Raymond E.: *See*—
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.
Loskorn, Richard A.; Biehl, Philip D.; and Catiller, Robert D., to Burroughs Corporation. Byte-oriented line adapter system. 4,514,824, Cl. 364-900.000.
Lossl, Gunter; Zauhar, Helmut; and Stock, Horst, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Method of sawing crystalline rods, and multiple-blade internal-hole saw for carrying out the method. 4,513,544, Cl. 51-283.00R.
Lotte Co., Ltd.: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,514,423, Cl. 426-3.000.
Loustau, Marie-Therese: *See*—
Atkin, John; and Loustau, Marie-Therese, 4,514,473, Cl. 429-10.000.
Loutfy, Rafik O.; and Hsiao, Cheng-Kuo, to Xerox Corporation. Photoconductive devices containing perylene dye compositions. 4,514,482, Cl. 430-78.000.
Louth, Kenneth, to Ampex Corporation. Head scanning servo system in a recording and/or reproducing apparatus. 4,514,671, Cl. 318-603.000.
Lowrance, Thomas F.; and Sharp, James B., to Lowrance, Thomas F. Stick transport apparatus. 4,513,856, Cl. 198-695.000.
Lu-Dai Sung, Rodney; Sweeney, William M.; and Zoleski, Benjamin H., to Texaco Inc. Wear-resistant aircraft engine lubricating oil. 4,514,311, Cl. 252-32.500.
Lucan, Andre: *See*—
Pon, Francois; Voirin, Jean-Philippe; and Lucan, Andre, 4,514,484, Cl. 430-106.600.
Lucas Industries: *See*—
Skinner, Robert T. J., 4,513,916, Cl. 239-453.000.
Lucas Industries PLC, Great King St.: *See*—
Hill, Michael; Megaw, John H. P. C.; and Harvey, Howard, 4,514,613, Cl. 219-121.0EC.
Lucey, Michael F., to Sprague Electric Company. Electronic component with UV-cured coating. 4,514,468, Cl. 428-418.000.
Ludens, James H.: *See*—
Hester, Jackson B., Jr.; and Ludens, James H., 4,514,407, Cl. 514-220.000.
Ludtke, Gerald W., to Motorola, Inc. Quick disconnect waveguide locking mechanism. 4,514,708, Cl. 333-255.000.
Luecke, Beth E.: *See*—
Zaruba, John V.; Hanson, Steven P.; Luecke, Beth E.; and Kuna, Wayne A., 4,514,175, Cl. 434-82.000.
Lueders, Willi H., to General Motors Corporation. Transducer clamping device. 4,513,933, Cl. 248-27.100.
Luhleich, Hartmut; and Dias, Francisco J., to Kernforschungsanlage Julich Gesellschaft Mit Beschrankter Haftung. Method of making thermal-shock resistant molded articles on the basis of silicon carbide. 4,514,346, Cl. 264-29.500.
LuK Lamellen und Kupplungsbau GmbH: *See*—
Reik, Wolfgang, 4,513,849, Cl. 192-70.270.
Lukenbach, Elvin R.: *See*—
Murray, William V.; Clum, Charles E.; and Lukenbach, Elvin R., 4,514,383, Cl. 424-59.000.
Lundqvist, Gosta B., to Flakt Aktiebolag. Apparatus for cooling telecommunications equipment in a rack. 4,514,746, Cl. 361-385.000.
Luryi, Sergey: *See*—
Bean, John C.; Kastalsky, Alexander; and Luryi, Sergey, 4,514,748, Cl. 357-58.000.
Luthy, Christoph; and Winternitz, Paul, to Hoffmann-La Roche Inc. 5-Oxo-3-thiazoline oxime and 2-oxo-5,6-dihydro-2H-1,4-thiazine oxime derivatives. 4,514,566, Cl. 544-56.000.
Luttgens, Werner, to A. Klebes GmbH & Co. K.G. Kunststoff- und Metallwarenfabrik. Sharpener, specifically for cosmetic sticks. 4,513,798, Cl. 144-28.110.
Lutz, Albert, to Universal Maschinenfabrik. Flat knitting machine for the production of knitted pieces with intarsia. 4,513,588, Cl. 66-126.00R.
Lyon Metal Products, Incorporated: *See*—
Steinke, Mark H., 4,513,669, Cl. 108-111.000.
M.A.N. Roland Druckmaschinen Aktiengesellschaft: *See*—
Hummel, Peter; and Kunkel, Fred, 4,513,663, Cl. 101-349.000.
Maas, Henricus G. R.: *See*—
van Ommen, Alfred H.; Maas, Henricus G. R.; Appels, Johannes A.; and Josquin, Wilhelmus J. M. J., 4,514,251, Cl. 156-628.000.
Mabe, Atsushi: *See*—
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, 4,514,150, Cl. 417-440.000.
Mabuchi, Kenichi, to Mabuchi, Kenichi. Beauty treatment device. 4,513,737, Cl. 128-52.000.
Machida, Kenji. Automatic level control circuit. 4,514,701, Cl. 330-137.000.
Macht, Jon A., to Owatonna Manufacturing Company, Inc. Vehicle frame. 4,514,007, Cl. 296-183.000.
MacLaughlin, Donald N.; and Fortuna, Vincent E., to Vercon Inc. Methods for oscillatory bonding of dissimilar thermoplastic materials. 4,514,242, Cl. 156-73.500.
Maddox, Jim, Jr., to Texaco Inc. Method of extracting and reutilizing surfactants from emulsions. 4,513,820, Cl. 166-266.000.
Madill, Michael J.: *See*—
Ives, Donald T.; Madill, Michael J.; and Sliva, Philip G., 4,514,444, Cl. 427-242.000.
Maenpaa , Immo: *See*—
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, 4,514,816, Cl. 364-478.000.
Magar, Surendar S.: *See*—
Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., 4,514,801, Cl. 364-200.000.
McDonough, Kevin C.; Swoboda, Gary L.; and Magar, Surendar S., 4,514,805, Cl. 364-200.000.
Magerle, Karl, to KMK Karl Magerle Lizenz AG. Apparatus for producing molded plastic articles such as packaging tubes. 4,514,159, Cl. 425-125.000.
Magid, David J., to Enviro-Spray Systems, Inc. Dispensing system and a refill pouch. 4,513,884, Cl. 222-94.000.
Magnetic Engineering Pty. Ltd.: *See*—
Fenton, Geoffrey J., 4,513,475, Cl. 16-360.000.
Magnetic Peripherals Inc.: *See*—
Haskal, Haim M.; and Briones, Robert A., 4,514,047, Cl. 350-394.000.
Maher, John W.; and Townsend, Greg M., to Motrola, Inc. Automatic level control system. 4,514,703, Cl. 330-279.000.
Mahoney, John A.; Helstrom, John J.; and Tait, A. Martin, to Standard Oil Company (Indiana). Solid hydrocarbon liquefaction with a catalyst having chromium and molybdenum. 4,514,279, Cl. 208-10.000.
Maier Enterprises, Inc.: *See*—
Maier, Otto H.; Seifert, James F.; Ryder, John C.; and Grisez, William F., 4,513,853, Cl. 198-410.000.
Maier, Joseph W. Round bale unroller. 4,514,127, Cl. 414-24.600.
Maier, Otto H.; Seifert, James F.; Ryder, John C.; and Grisez, William F., to Maier Enterprises, Inc. Cooling bed construction. 4,513,853, Cl. 198-410.000.
Mailliet, Pierre: *See*—
Legille, Edouard; Mailliet, Pierre; and Lonardi, Emile, 4,514,129, Cl. 414-200.000.
Mailroom Systems, Inc.: *See*—
Hedrick, Robert, 4,514,128, Cl. 414-49.000.
Maintel Pty. Limited: *See*—
Wallace, John L., 4,514,012, Cl. 299-57.000.
Maisonneuve, Richard Z., to Manoir International, Inc. Hot water system using a compressor. 4,513,585, Cl. 62-238.600.
Majthan, Rudolf; Stuhler, Rolf; Parsonage, Raymond G.; and Packham, Charles C., to Braun AG. Compact electric hair dryer. 4,514,618, Cl. 219-370.000.
Makamori, Shigeru: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Makino, Hiroshi; Higuchi, Masaru; and Murata, Kazuou, to West Electric Company, Ltd. Distance measuring apparatus. 4,514,084, Cl. 356-4.000.
Malinen, Pekka: *See*—
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, 4,514,816, Cl. 364-478.000.
Mallon, Joseph R., Jr.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., Jr., 4,513,623, Cl. 73-721.000.
Mallow, Peter. Scented tissue-dispensing container. 4,513,862, Cl. 206-233.000.
Manecke, Kurt A., to Brown & Williamson Tobacco Corporation. Method of making filter for a cigarette product. 4,514,180, Cl. 493-41.000.
Mannesmann Aktiengesellschaft: *See*—
Niehaus, Norbert; Friehe, Werner; and Schwenk, Wilhelm, 4,513,995, Cl. 285-55.000.
Manning, George H.; and Riccio, Pasquale R., to MFE Corporation. Streaming cassette tape transport. 4,514,775, Cl. 360-96.600.
Manoir International, Inc.: *See*—
Maisonneuve, Richard Z., 4,513,585, Cl. 62-238.600.
Manservisi, Renato; and Fossi, Mario, to Sasib S.p.A. Wrapper sheet for cigarette packs, and method for obtaining same. 4,513,908, Cl. 229-87.00C.
Mapatent, N.V.: *See*—
Fellner, Theodore F.; and Talo, Leslie C., 4,513,858, Cl. 198-812.000.
Maples, James A.: *See*—
Pepper, Robert B.; and Maples, James A., 4,514,817, Cl. 364-480.000.
Marek, Raymond G.: *See*—
Batcheler, Jerry H.; and Marek, Raymond G., 4,514,722, Cl. 340-604.000.
Marey, Daniel J., to S.N.E.C.M.A. Safety stop for a variable setting stator blade pivot. 4,514,141, Cl. 415-160.000.

Marinesco, Jon D.: *See*—
Opresco, Ovidiu; and Marinesco, Jon D., 4,513,970, Cl. 273-153.00S.
Maringer, Melvin F.: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,535, Cl. 524-109.000.
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,536, Cl. 524-261.000.
Mark, Harold W.: *See*—
Bresson, Clarence R.; and Mark, Harold W., 4,514,293, Cl. 209-167.000.
Mark, Victor, to General Electric Company. Polyphenolic compounds. 4,514,334, Cl. 260-395.000.
Mark, William J.: *See*—
Borg, Arthur N.; and Mark, William J., 4,514,764, Cl. 358-181.000.
Marley Cooling Tower Company, The: *See*—
Kinney, Ohler L., Jr.; and Holmberg, Joyce D., 4,514,202, Cl. 55-440.000.
Marriage, David J.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.
Martell, Charles R.; Isett, Donald D.; and Abney, Paul A., to Microdynamics, Inc. Method and apparatus for automatically decelerating and stopping a sewing machine motor. 4,513,676, Cl. 112-262.100.
Martha White Foods, Inc.: *See*—
Jordan, J. Kirk; and Scherling, Sandra L., 4,514,426, Cl. 426-113.000.
Martin, Gerard: *See*—
Develle, Guy; and Martin, Gerard, 4,514,198, Cl. 55-337.000.
Martin, Joel L., to Phillips Petroleum Company. Process and vanadium catalyst for olefin polymerization. 4,514.514, Cl. 502-121.000.
Martin, Lawrence L.; and Setescak, Linda L., to Hoechst-Roussel Pharmaceuticals Inc. Substituted 4,10-dihydro-10-oxothieno benzoxepins. 4,514,411, Cl. 514-215.000.
Martinowich, John N.: *See*—
Triner, Irvin R.; and Martinowich, John N., 4,514,030, Cl. 339-176.0MP.
Maruoka, Sigehiro, to Honda Motor Co., Ltd. Synthetic resin windscreen for motorcycles, motor tricycles, etc. 4,514,006, Cl. 296-78.100.
Maruyama, Seiichro: *See*—
Kawaguchi, Yoshikazu; Maruyama, Seiichro; and Kawasaki, Hiroyuki, 4,514,357, Cl. 264-328.160.
Marvin Glass & Associates: *See*—
Zaruba, John V.; Hanson, Steven P.; Luecke, Beth E.; and Kuna, Wayne A., 4,514,175, Cl. 434-82.000.
Marx, Matthias; Ganss, Helmut; and Frank, Wolfram, to BASF Aktiengesellschaft. Storage-stable tris(hydroxyalkyl)isocyanurate polyol dispersions, process for their preparation and their utilization. 4,514,526, Cl. 521-166.000.
Masai, Hiroshi: *See*—
Fujiyama, Seiichi; Minakami, Hiroyuki; and Masai, Hiroshi, 4,514,563, Cl. 536-123.000.
Maschinenfabrik Ernst Thielenhaus GmbH: *See*—
Wolters, Martin; and Meuer, Gerd R., 4,513,538, Cl. 51-131.300.
Masco Corporation of Indiana: *See*—
Purcell, Glenn T., 4,513,769, Cl. 137-315.000.
Mase, Ryoichi, to Toso Kabushiki Kaisha. Decelerator for use in roller blinds. 4,513,805, Cl. 160-299.000.
Masonite Corporation: *See*—
Hsu, Oscar H. H.; and Tassler, Milford C., 4,514,532, Cl. 524-14.000.
Massachusetts Institute of Technology: *See*—
Fan, John C. C.; and Bozler, Carl O., 4,514,581, Cl. 136-255.000.
Masuhara, Toshiaki: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, 4,514,766, Cl. 358-213.000.
Masui, Yasuyuki: *See*—
Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, 4,513,753, Cl. 128-706.000.
Mathieu, Bernd; and Polaschegg, Hans-Dietrich, to Fresenius AG. Dialysis apparatus. 4,514,295, Cl. 210-90.000.
Matlock, Gordon E. Wood cross-tie end plating machine. 4,513,900, Cl. 227-42.000.
Matlock, Paul L.: *See*—
Matulewicz, William N.; Mohr, Paul H.; and Matlock, Paul L., 4,514,315, Cl. 252-75.000.
Matsuda, Ikuo: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,513,707, Cl. 123-242.000.
Matsuda, Kenji: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,514,513, Cl. 502-112.000.
Matsui, Kazuhiko: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Matsui, Mitsuo; and Matsumura, Teruyuki, to Fanuc Ltd. Method of controlling electric discharge machine. 4,514,611, Cl. 219-69.00M.
Matsumoto, Nobuya: *See*—
Yoshizumi, Hajime; Matsumoto, Nobuya; Fukuda, Osamu; and Fukushi, Osamu, 4,514,496, Cl. 435-162.000.
Matsumoto, Tatsuhiko: *See*—
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Matsumura, Teruyuki: *See*—
Matsui, Mitsuo; and Matsumura, Teruyuki, 4,514,611, Cl. 219-69.00M.
Matsusaka, Chikako: *See*—
Yamahira, Yoshiya; Shima, Katsuhiko; Matsusaka, Chikako; and Noguchi, Tetsuo, 4,514,386, Cl. 424-81.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Miyata, Yutaka; Chikamura, Takao; and Fujiwara, Shinji, 4,514,765, Cl. 358-213.000.
Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, 4,514,451, Cl. 428-141.000.
Matsushita Electric Works, Ltd.: *See*—
Nagamoto, Mitsuki; and Kubota, Takuo, 4,514,711, Cl. 335-243.000.
Nakano, Kunimitsu; Chuzawa, Takaaki; and Ohmuro, Masaru, 4,514,709, Cl. 335-201.000.
Suzuki, Yoshiharu; Fukagawa, Hitoshi; Komoda, Yoshiyuki; and Tanaka, Osamu, 4,514,719, Cl. 340-310.00R.
Matsushita, Yoshihiro: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.
Matsuura, Masaru, to Kikkoman Corporation. Process for producing an aseptic packed tofu. 4,514,433, Cl. 426-634.000.
Matsuura, Tadashi; and Kadomatsu, Yasuo, to Ricoh Co., Ltd. Method for preparation of selenium type electrophotographic element in which the substrate is superfinished by vibrating and sliding a grindstone. 4,514,483, Cl. 430-84.000.
Matsuzaka, Syoji: *See*—
Koitabashi, Takeo; Matsuzaka, Syoji; Hotta, Yuji; and Iwata, Masatoshi, 4,514,491, Cl. 430-567.000.
Matsuzawa, Kiyoshi; and Inoue, Noriyuki, to Fuji Xerox Co., Ltd. Apparatus for controlling optical system for copying machine. 4,514,080, Cl. 355-14.00C.
Mattel, Inc.: *See*—
Halford, Wayne R.; and Nakano, Walter S., 4,513,967, Cl. 273-108.000.
Matthews, Anthony J.: *See*—
Berthel, Robert O.; Plank, Vernon G.; Jones, Stephen H.; and Matthews, Anthony J., 4,514,758, Cl. 358-93.000.
Matthews, Charles G. Arc welding clamp. 4,514,033, Cl. 339-255.00P.
Matthews, Kenneth J.: *See*—
Shaefer, Robert R.; and Matthews, Kenneth J., 4,514,244, Cl. 156-158.000.
Matulewicz, William N.; Mohr, Paul H.; and Matlock, Paul L., to Union Carbide Corporation. Aluminum corrosion inhibitor comprising alkylene-silane graft copolymer. 4,514,315, Cl. 252-75.000.
Matumoto, Hiroaki; and Sekiguchi, Hiroshi, to Kanars Data Corporation. Electronic damper for pulse motor. 4,514,675, Cl. 318-696.000.
Matuo, Tadashi: *See*—
Sato, Giichi; Matuo, Tadashi; and Tabei, Tooru, 4,514,559, Cl. 534-690.000.
Matzkanin, George A.: *See*—
De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., 4,514,691, Cl. 324-301.000.
Maukola, Pekka J., to N. V. Raychem S.A. Reinsulation of pipe joints. 4,514,241, Cl. 156-79.000.
Maulandi, Aymon A., to Square D Company. Low resistance electrical connector. 4,514,025, Cl. 339-64.00M.
Maurer, Klemens: *See*—
Taylor, Frank; and Maurer, Klemens, 4,514,104, Cl. 403-14.000.
Mauthner, Thomas: *See*—
Russo, Anthony; and Mauthner, Thomas, 4,514,325, Cl. 252-557.000.
Mawhinney, Daniel D.: *See*—
Nowogrodzki, Markus; and Mawhinney, Daniel D., 4,513,748, Cl. 128-653.000.
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Witte, Klaus J.; Fill, Ernst; and Scrlac, Walter, 4,514,848, Cl. 372-25.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften: *See*—
Wissler, Josef H., 4,514,387, Cl. 424-85.000.
Maxwell, John W.; and Vyse, Brian, to Borden, Inc. Process for the manufacture of dried, resin-treated fiber furnish. 4,514,255, Cl. 162-9.000.
May, Stefan; and Muller, Hans, to GAO Gesellschaft fur Automation and Organisation mbH. Data carrier having a picture theme superimposed by a line pattern and a method of producing same. 4,513,992, Cl. 283-94.000.
Mayer, Andreas: *See*—
Jenny, Ernst; Mayer, Andreas; and Moser, Peter, 4,513,571, Cl. 60-603.000.
Mayfield, Glenn A., to Duncan Electric Company, Inc. Power transducer. 4,514,686, Cl. 324-142.000.
Mazzagatti, Concezio. Self-sealing abutment. 4,514,154, Cl. 418-129.000.
McConchie, Burton G.: *See*—
Wang, An; and McConchie, Burton G., 4,514,063, Cl. 353-28.000.
McDaniel, W. F. Tillage tool for forming an underground water retention tunnel. 4,513,521, Cl. 37-193.000.

McDonald, David B.: *See*—
Thomas, Michael J.; and McDonald, David B., 4,513,771, Cl. 137-315.000.

McDonald, Neil, to Raydex International Limited. Cable having a laminated plastic insulating sheath. 4,514,036, Cl. 350-96.230.

McDonnell, Michael M., to United States of America, Army. Incoherent optical heterodyne Fourier transformer. 4,514,059, Cl. 350-162.160.

McDonough, Kevin C.; Swoboda, Gary L.; and Magar, Surendar S., to Texas Instruments Incorporated. Interrupt operation in systems emulator mode for microcomputer. 4,514,805, Cl. 364-200.000.

McDonough, Kevin C.: *See*—
Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., 4,514,801, Cl. 364-200.000.

McDougal, John A. Ignition coil. 4,514,712, Cl. 336-96.000.

McElhaney, Ramon L.: *See*—
Damani, Nalinkant C.; Bhagat, Haresh G.; and McElhaney, Ramon L., 4,514,385, Cl. 424-81.000.

McGarry, Phillip E.; Herman, David E.; Treskot, Robert A.; and Fistner, David C., Sr., to Standard Oil Company, The. Apparatus and method for flotation separation utilizing an improved spiral spray nozzle. 4,514,291, Cl. 209-166.000.

McGraw-Edison Company: *See*—
Veverka, Edward F., 4,514,606, Cl. 200-146.00R.

McHale, Edward J.; Hussain, Yousif A.; Sanderson, Michael L.; and Hemp, John, to Foxboro Company, The. Capacitively-coupled magnetic flowmeter. 4,513,624, Cl. 73-861.120.

McInerney, Charles E.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,513,730, Cl. 123-564.000.

McIntire, Darrell L., to Leggett & Platt, Incorporated. Sofa sleeper seat support system. 4,513,460, Cl. 5-13.000.

McIntire, Kenneth R.: *See*—
Braatz, James A.; McIntire, Kenneth R.; and Princler, Gerald L., 4,514,506, Cl. 436-518.000.

McIntosh, Donald S., to McIntosh, John D.; and Giegler, Mike Charles, part interest to each. Two-position bumper. 4,514,002, Cl. 293-118.000.

McIntosh, John D.: *See*—
McIntosh, Donald S., 4,514,002, Cl. 293-118.000.

McKean, John A., to Titan Tool Company. Automatic stud driving tool. 4,513,643, Cl. 81-53.200.

McKelvy, James W.: *See*—
Miller, Walter E., Jr.; and McKelvy, James W., 4,514,690, Cl. 324-225.000.

McKenna, James J. Circular locking device. 4,514,109, Cl. 403-370.000.

McKinley, Bruce A.: *See*—
Cheng, Tai C.; and McKinley, Bruce A., 4,514,620, Cl. 219-553.000.

McMath, Henry G.; and Stenerson, Gary K., to Exxon Research and Engineering Co. Process for heating solids in a transfer line. 4,514,168, Cl. 432-14.000.

McMurtry, David R., to Renishaw Electrical Limited. Numerically controlled machine tool. 4,513,646, Cl. 82-1.00C.

Mead Corporation, The: *See*—
Jones, David E., 4,514,735, Cl. 346-1.100.

Meador, Richard A., to Texaco Inc. Dielectric well logging system with electrostatically shielded coils. 4,514,693, Cl. 324-338.000.

Mechanical Transplanter Company: *See*—
Nyboer, Duane A., 4,513,530, Cl. 47-9.000.

Meco Equipment Engineers B.V.: *See*—
Piepers, Harry C., 4,514,264, Cl. 204-15.000.

Megaw, John H. P. C.: *See*—
Hill, Michael; Megaw, John H. P. C.; and Harvey, Howard, 4,514,613, Cl. 219-121.0EC.

Mehalla, Hacene, to Societe Chimique des Carbonnages S.A. Aromatic hydrocarbon resins containing vinylketone groups and polymers thereof. 4,514,542, Cl. 525-193.000.

Meier, Werner: *See*—
Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joachim, 4,514,670, Cl. 318-467.000.

Meierhoefer, Eugene J., to Health Care Concepts, Inc. Container with integrally formed non-coring and non-leaking piercing site. 4,513,871, Cl. 215-32.000.

Melancon, Ronald D. Fish food or bait and method and apparatus for manufacturing same. 4,513,657, Cl. 99-472.000.

Melissa, Raymond F.; Grummett, Lorne H.; and Chamberlain, John C., to Trilog, Inc. Dot matrix line printer. 4,513,661, Cl. 101-93.040.

Melman, Paul: *See*—
Carlsen, W. John; and Melman, Paul, 4,514,046, Cl. 350-385.000.

Melocik, Grant C.; and Pickering, William, to Towmotor Corporation. Current limit control circuit. 4,514,665, Cl. 318-139.000.

Meltzner, Bernard R.: *See*—
Filbey, Allen H.; Braxton, Henry G., Jr.; and Meltsner, Bernard R., 4,514,577, Cl. 568-744.000.

Melvin, George E.: *See*—
Darves-Bornoz, Yves; Melvin, George E.; Ryan, Michael G.; and Saylor, Dennis L., 4,513,613, Cl. 73-159.000.

Melzi, Edward R.; and Sharon, Arie. Disposable oil drain pan and container combination. 4,513,865, Cl. 206-508.000.

Melzi, Edward R.; and Sharon, Arie. No-flip, no-drip container. 4,513,883, Cl. 222-83.000.

Mendelson, Richard N.; O'Neal, Douglas M.; and Sharp, Leo A., Jr., to International Business Machines Corporation. Apparatus and method for extending a parallel channel to a serial I/O device. 4,514,823, Cl. 364-900.000.

Mensink, Kornelis A.: *See*—
van Arragon, Gerrit W.; Mensink, Kornelis A.; and Wittkampf, Frederik H. M., 4,513,743, Cl. 128-419.0PG.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Irmscher, Klaus; and Uhl, Jurgen, 4,514,405, Cl. 514-46.000.
Tuong, Huynh-Ba; Kelly, Stephen M.; and Osman, Maged A., 4,514,317, Cl. 252-299.620.

Merrell, Richard G.; and Auld, Fredreck H., to Zenith Electronics Corporation. Data encryption technique for subscription television system. 4,514,761, Cl. 358-122.000.

Metal Box, PLC: *See*—
Bull, Cyril A., 4,513,872, Cl. 220-74.000.

Methode Electronics, Inc.: *See*—
Triner, Irvin R.; and Martinowich, John N., 4,514,030, Cl. 339-176.0MP.

Meuer, Gerd R.: *See*—
Wolters, Martin; and Meuer, Gerd R., 4,513,538, Cl. 51-131.300.

Meyer, Horst; and Landwehr, Gunter, to Kochs Adler AG. Presser foot automatic lifting device. 4,513,675, Cl. 112-236.000.

Meyer, John D., to Hewlett-Packard Company. Thermal ink jet printer utilizing a printhead resistor having a central cold spot. 4,514,741, Cl. 346-140.00R.

Meyer, Willy; and Fory, Werner, to Ciba Geigy Corporation. N-Phenylsulfonyl-N'-triazinylureas. 4,514,212, Cl. 71-93.000.

Meynet, Armando E. Apparatus to process pizza dough. 4,514,089, Cl. 366-69.000.

MFE Corporation: *See*—
Manning, George H.; and Riccio, Pasquale R., 4,514,775, Cl. 360-96.600.

Michels, Donald E., to Republic Geothermal, Inc. Method for reducing scale in geothermal systems. 4,513,818, Cl. 166-244.00C.

Michna, Martin; and Henk, Hermann, to Bayer Aktiengesellschaft. Use of disazo-copper complex dyestuffs for dyeing natural and synthetic materials. 4,514,188, Cl. 8-641.000.

Microdynamics, Inc.: *See*—
Martell, Charles R.; Isett, Donald D.; and Abney, Paul A., 4,513,676, Cl. 112-262.100.

Microlife Technics, Inc.: *See*—
Raccach, Moshe, 4,514,424, Cl. 426-56.000.

Micronix Partners: *See*—
Novak, W. Thomas, 4,514,858, Cl. 378-034.000.

Mientek, Anthony P., to United States of America, Energy. Fuel cell separator with compressible sealing flanges. 4,514,475, Cl. 429-35.000.

Mikeal, Gary L.: *See*—
Deibert, Richard L.; and Mikeal, Gary L., 4,514,683, Cl. 324-110.000.

Milei GmbH: *See*—
Grzinia, Michael, 4,514,432, Cl. 426-656.000.

Millay, Lawrence I.; and Dzewaltowski, Victor F., to Ex-Cell-O Corporation. Machine workhead with magnetic driver. 4,513,541, Cl. 51-237.00R.

Miller, Alex E., to Union Oil Company of California. Catalytic process for converting 2-oxazolidinones to their corresponding alkanolamines. 4,514,379, Cl. 423-228.000.

Miller, Benjamin D.: *See*—
Koeneman, Robert M.; Miller, Benjamin D.; Jablonski, Thaddeus M.; and Schafer, Albert L., 4,513,892, Cl. 222-235.000.

Miller, Carl; and Hogan, Lawrence R., to Baxter Travenol Laboratories, Inc. High speed bulk compounder. 4,513,796, Cl. 141-83.000.

Miller, Ira; and Null, Michael W., to Motorola, Inc. ECL To TTL output stage. 4,514,651, Cl. 307-475.000.

Miller, Ira: *See*—
Dotson, Robert N.; Davies, Robert B.; and Miller, Ira, 4,514,648, Cl. 307-350.000.

Miller, Peter S.; and Hall, Maclin S., to Owens-Illinois, Inc. Method and apparatus for controlling the thickness of a lamina of a coextruded laminate. 4,514,812, Cl. 364-473.000.

Miller, Walter E., Jr.; and McKelvy, James W., to United States of America, Army. Power line field interference rejection for magnetic sensors. 4,514,690, Cl. 324-225.000.

Milliken Research Corporation: *See*—
Frye, Samuel M.; and Singleton, James O., 4,514,134, Cl. 414-659.000.

Minakami, Hiroyuki: *See*—
Fujiyama, Seiichi; Minakami, Hiroyuki; and Masai, Hiroshi, 4,514,563, Cl. 536-123.000.

Minami, Shinichi: *See*—
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, 4,514,830, Cl. 365-200.000.

Minami, Shunji; and Kimura, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Device for supplying fuel to a pressure carburetor. 4,513,725, Cl. 123-511.000.

Minato, Akira: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.

Minezaki, Shigehiro, to Sharp Kabushiki Kaisha. Manufacture of thin film transistor. 4,514,253, Cl. 156-659.100.

Ming, Paul T., to Imperial Chemical Industries PLC. Pipeline monitoring apparatus. 4,514,730, Cl. 340-815.260.

Minnesota Mining and Manufacturing Company: *See*—
Huffman, William A.; and Brown, Harvey A., 4,514,045, Cl. 350-351.000.
Sasaki, Makoto, 4,514,457, Cl. 428-204.000.

Minolta Camera Kabushiki Kaisha: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.
Wada, Kenichi; Oka, Tateki; and Tabuchi, Kenji, 4,514,480, Cl. 430-30.000.
Yamaguchi, Tamikazu, 4,514,052, Cl. 350-466.000.
Minster Machine Company, The: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,513,600, Cl. 72-345.000.
Mioche, Robert, to Compagnie Generale des Etablissements Michelin. Method and apparatus for obtaining sheets from a flexible material, particularly a latex coagulum. 4,513,648, Cl. 83-871.000.
Miro Industries, Inc.: *See*—
Pruyne, Jerry R., 4,513,934, Cl. 248-49.000.
Mirodan, Ets. Louis D'Haene & Sons: *See*—
Dricot, Jean-Marie, 4,513,649, Cl. 83-883.000.
Mirow, Fred A.; and Quinones, Matthew M., to Honeywell Information Systems Inc. Apparatus for generating trapezoidal signals over a single conductor coaxial bus. 4,514,820, Cl. 364-858.000.
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, to Toda Kogyo Corp. Acicular ferromagnetic alloy particles for magnetic recording and process for producing the same. 4,514,216, Cl. 75-0.5AA.
Misty Vapor, Inc.: *See*—
Webb, Richard, 4,513,726, Cl. 123-523.000.
Mitani, Tsuneyoshi: *See*—
Asai, Mamoru; Mitani, Tsuneyoshi; and Ookawa, Hiroyuki, 4,514,856, Cl. 377-8.000.
Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., to Mitco Water Laboratories Inc. Removal of bitter naringin and limonin from citrus juices containing the same. 4,514,427, Cl. 426-271.000.
Mitch's Self Service Gas, Inc.: *See*—
Hayes, Terry S., 4,513,617, Cl. 73-313.000.
Mitco Water Laboratories Inc.: *See*—
Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,514,427, Cl. 426-271.000.
Mitsubishi Chemical Industries, Limited: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, 4,514,525, Cl. 521-112.000.
Kawaguchi, Yoshikazu; Maruyama, Seiichro; and Kawasaki, Hiroyuki, 4,514,357, Cl. 264-328.160.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ogawa, Hitoshi, 4,514,155, Cl. 418-149.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo, 4,513,639, Cl. 74-866.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Izumo, Masatoshi, 4,514,119, Cl. 409-60.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Kawakita, Shizuo; Shibazaki, Takeyoshi; and Mochida, Hiromi, 4,514,223, Cl 75-77.000.
Nishigaki, Kenichi, 4,514,224, Cl. 75-238.000.
Mitsubishi Oil Company, Limited: *See*—
Takahashi, Yoshio; and Shoji, Takeshi, 4,514,544, Cl. 525-327.400.
Mitsubishi Rayon Co., Ltd.: *See*—
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, 4,514,551, Cl. 526-233.000.
Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See*—
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,514,445, Cl. 427-410.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Nojiri, Takeo; and Irie, Yasuo, 4,514,146, Cl. 416-200.00R.
Mitsui Toatsu Chemicals, Inc.: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.
Mittelhauser, Bernhard. External rear view mirror for motor vehicles which folds. 4,514,060, Cl. 350-632.000.
Miura, Kunio: *See*—
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, 4,514,810, Cl. 364-424.000.
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, to Ajinomoto Co., Inc. Composite plasmid. 4,514,502, Cl. 435-253.000.
Miyaguchi, Shoji, to Nippon Telegraph & Telephone Public Corporation. Cryptosystem. 4,514,592, Cl. 178-22.110.
Miyaki, Yoshiyuki; Fujita, Yoshitaka; Se, Kazunori; and Fujimoto, Teruo, to Toyo Soda Manufacturing Ltd. Method for purifying and concentrating organic matters. 4,514,304, Cl. 210-638.000.
Miyamae, Tatsuo: *See*—
Ushiyama, Hisayuki; Ochi, Hisayuki; Miyamae, Tatsuo; and Wakamiya, Katsutoshi, 4,514,485, Cl. 430-106.600.
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, to Hitachi, Ltd. Field controlled thyristor with double-diffused source region. 4,514,747, Cl. 357-38.000.
Miyata, Shigeo, to Kyowa Chemical Industry Co. Ltd. Gastric antacid and method for controlling pH of gastric juice. 4,514,389, Cl. 424-128.000.
Miyata, Yutaka; Chikamura, Takao; and Fujiwara, Shinji, to Matsushita Electric Industrial Co., Ltd. Solid-state image sensor. 4,514,765, Cl. 358-213.000.
Miyazaki, Jun: *See*—
Iida, Shinzo; Ie, Katsuji; and Miyazaki, Jun, 4,513,806, Cl. 164-413.000.
Miyazaki, Takeshi: *See*—
Sugiyama, Kenji; and Miyazaki, Takeshi, 4,513,489, Cl. 29-520.000.
Mizobuchi, Norihiro; Furukawa, Keiji; and Motoyama, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigerator cooling and freezing system. 4,513,581, Cl. 62-197.000.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Exposure control circuit for TTL automatic electronic flash. 4,514,074, Cl. 354-416.000.
Mladek, Milos: *See*—
Rajsigl, Zdenek; Mladek, Milos; Blasko, Michal; and Smatana, Josef, 4,513,566, Cl. 57-406.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,514,378, Cl. 423-18.000.
Bowden, Edgar A.; and Przybyl, Robert V., 4,514,770, Cl. 360-69.000.
Heilweil, Israel J., 4,514,310, Cl. 252-8.55R.
Herrington, Fox J., Jr., 4,513,559, Cl. 53-429.000.
Islip, Philip N.; and Shu, Winston R., 4,513,819, Cl. 166-263.000.
Kremer, Ross A.; and Saunders, Stephen W., 4,514,288, Cl. 209-5.000.
Rhynard, Donald L., 4,513,606, Cl. 73-61.00R.
Shu, Winston R., 4,513,821, Cl. 166-273.000.
Mobile Dental Equipment Corporation: *See*—
Moore, Peter E., 4,514,019, Cl. 312-209.000.
Mochida, Hiromi: *See*—
Kawakita, Shizuo; Shibazaki, Takeyoshi; and Mochida, Hiromi, 4,514,223, Cl. 75-77.000.
Mochiji, Kozo: *See*—
Kimura, Takashi; Mochiji, Kozo; and Obayashi, Hidehito, 4,514,857, Cl. 378-034.000.
Mochizuki, Kanji: *See*—
Sato, Atsushi; Murai, Yoshikazu; Goto, Masahito; and Mochizuki, Kanji, 4,514,229, Cl. 106-135.000.
Modjallal, Khosrow: *See*—
Whetstone, Albert L.; Shaklee, Kerry L.; and Modjallal, Khosrow, 4,514,726, Cl. 340-710.000.
Moe, Gregory: *See*—
Kaiser, Emil T.; and Moe, Gregory, 4,514,331, Cl. 260-112.50T.
Moerschel, Kenneth G., to AT&T Technologies, Inc. Methods of highlighting pinholes in a surface layer of an article. 4,514,436, Cl. 427-10.000.
Mohlenbrink, Wolfgang: *See*—
Nussbaumer, Manfred; Beitinger, Eberhard; and Mohlenbrink, Wolfgang, 4,513,504, Cl. 33-1.00H.
Mohr, Paul H.: *See*—
Matulewicz, William N.; Mohr, Paul H.; and Matlock, Paul L., 4,514,315, Cl. 252-75.000.
Moiroux, Auguste, to Societe Civile Styled: BMB. Piston for internal combustion engine. 4,513,697, Cl. 123-41.350.
Molders, Werner; Langanke, Rolf; Sentinger, Egon; and Reuschenbach, Hermann, to Gas Spring Company, Division of Fichtel & Sachs Industries, Inc. Gas spring with extension force controlled as a function of temperature. 4,513,953, Cl. 267-121.000.
Momoshima, Yukichi: *See*—
Nagasaka, Nobuyuki; and Momoshima, Yukichi, 4,513,650, Cl. 84-1.030.
Momyer, William R.; and Littauer, Ernest L., to Lockheed Missiles & Space Company, Inc. Air cathode structure manufacture. 4,514,474, Cl. 429-27.000.
Monarch Wine Co., Inc.: *See*—
Pato, Carlos M., 4,514,306, Cl. 210-740.000.
Zaltsman, Efim, 4,513,870, Cl. 215-31.000.
Mongelli, Nicola; and Gandolfi, Carmelo, to Farmitalia Carlo Erba S.p.A. 15-Cycloaliphatic derivatives of 13,14-didehydro-carboprostacyclins and process for their preparation. 4,514,396, Cl. 514-222.000.
Monitronik Ltee: *See*—
Taylor, Frank; and Maurer, Klemens, 4,514,104, Cl. 403-14.000.
Monsanto Company: *See*—
Gomez, I. Luis, 4,514,464, Cl. 428-332.000.
Hobbs, Charles F., 4,514,519, Cl. 502-243.000.
Tou, Jacob S.; and Schleppnik, Alfred A., 4,514,340, Cl. 260-465.00D.
Montgomery Hosiery Mill, Inc.: *See*—
Kearns, Chester L., 4,513,589, Cl. 66-180.000.
Montgomery, Lionel C., to Union Carbide Corporation. Process for improving the high temperature flexural strength of titanium diboride-boron nitride. 4,514,355, Cl. 264-332.000.
Montierth, Max R.: *See*—
Darcangelo, Charles M.; Montierth, Max R.; and Ni, Yang-Chou M., 4,514,205, Cl. 65-12.000.
Moog S.A.R.L.: *See*—
Contartese, Giulio; and Dietz, Joachim, 4,513,782, Cl. 137-625.630.
Mookherjee, Braja D.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,514,324, Cl. 252-522.00R.
Moore, Clifford G.: *See*—
Finley, Charles M.; and Moore, Clifford G., 4,514,681, Cl. 324-65.0CR.
Moore, Dan T., III; and Fischer, Michael F., to Dan T. Moore Co. Tire for wheelchairs and the like. 4,514,243, Cl. 156-113.000.
Moore, Peter E., to Mobile Dental Equipment Corporation. Portable dental operatory. 4,514,019, Cl. 312-209.000.
Moore, Richard P. Sludge traction and desludging system. 4,514,303, Cl. 210-519.000.
Morehouse Industries, Inc.: *See*—
Szkaradek, Edward J., 4,513,917, Cl. 241-46.110.
Moreno, Gil G. Device for joining tubular members. 4,514,107, Cl. 403-230.000.

Morey, Marian B.: *See*—
Kuhnsman, Alexandra; and Morey, Marian B., 4,513,692, Cl. 119-109.000.
Morgan, John M. Wire-routing device. 4,514,004, Cl. 294-19.100.
Mori, Masaaki: *See*—
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.
Mori, Yoshikazu; Kojima, Susumu; and Kobayashi, Osamu, to Kabushiki Kaisha Nippon Coinco. Bill retention device. 4,513,880, Cl. 221-260.000.
Moriguchi, Haruhiko; and Inui, Toshiharu, to Fuji Xerox Co., Ltd. Thermal head. 4,514,736, Cl. 346-76.0PH.
Morimoto, Akira: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.
Morita, Hideaki: *See*—
Kasuya, Takahiro; Morita, Hideaki; Takagiwa, Hiroyuki; and Yamakawa, Goichi, 4,514,487, Cl. 430-137.000.
Morita, Yasuhiro; and Tsukamoto, Yoshikazu, to Toyota Kidosha Kabushi Kaisha; and Tokai Rubber Industries, Ltd. Bushing structure in a vehicle suspension system. 4,513,990, Cl. 280-725.000.
Moriuchi, Hisahiro: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.
Morrill, Charles D.: *See*—
Hynes, Joseph H.; and Morrill, Charles D., 4,513,823, Cl. 166-386.000.
Morris, Anthony F.: *See*—
Escher, Sina D.; and Morris, Anthony F., 4,514,323, Cl. 252-522.00R.
Morrison, David A.: *See*—
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,514,069, Cl. 354-304.000.
Morse, David L.: *See*—
Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,514,053, Cl. 350-162.200.
Morton Norwich Products: *See*—
Orelup, Richard B., 4,514,503, Cl. 436-60.000.
Moser, Peter: *See*—
Jenny, Ernst; Mayer, Andreas; and Moser, Peter, 4,513,571, Cl. 60-603.000.
Motor Wheel Corporation: *See*—
Woelfel, James A.; and Smith, Richard W., 4,514,013, Cl. 301-63.0PW.
Motorola, Inc.: *See*—
Dotson, Robert N.; Davies, Robert B.; and Miller, Ira, 4,514,648, Cl. 307-350.000.
Dydyk, Michael; and Iwer, Herbert W., 4,514,707, Cl. 331-107.0SL.
Garcia, Carlos N.; Rigg, Bryan C.; and Tanner, Sally A., 4,514,489, Cl. 430-327.000.
Genrich, Thad J., 4,514,696, Cl. 328-14.000.
Ludtke, Gerald W., 4,514,708, Cl. 333-255.000.
Miller, Ira; and Null, Michael W., 4,514,651, Cl. 307-475.000.
Motoyama, Takeshi: *See*—
Mizobuchi, Norihiro; Furukawa, Keiji; and Motoyama, Takeshi, 4,513,581, Cl. 62-197.000.
Motrola, Inc.: *See*—
Maher, John W.; and Townsend, Greg M., 4,514,703, Cl. 330-279.000.
Moulder, John F.: *See*—
Nowicki, Ronald S.; and Moulder, John F., 4,513,905, Cl. 228-123.000.
Mount Isa Mines Limited: *See*—
Denholm, William T.; Floyd, John M.; Errington, William J.; and Parry, Anthony N., 4,514,222, Cl. 75-77.000.
Mowatt-Larssen, Erling: *See*—
Davis, Edward L.; and Mowatt-Larssen, Erling, 4,513,795, Cl. 141-35.000.
Moyle, William R.: *See*—
Canfield, Robert E.; Ehrlich, Paul H.; and Moyle, William R., 4,514,505, Cl. 436-500.000.
MTU Motoren und Turbinen-Union Friedrichshafen GmbH: *See*—
Kamleitner, Ewald, 4,513,724, Cl. 123-500.000.
Mucaro, Salvatore A.; and Tilbor, Neil, to CBS Inc. Vehicle jump for a toy vehicle game. 4,513,966, Cl. 273-68.00B.
Muirhead, Robert C., Jr.; and Shaver, Donald L., to Cornnuts Hybrids, Inc. Genetic factor capable of altering leaf number and distribution in maize. 4,513,532, Cl. 47-58.000.
Mukaizaka, Akira: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,514,216, Cl. 75-0.5AA.
Mulawski, Walter J., to Sexton Can Company, Inc. Pressure relief device for internally pressurized fluid container. 4,513,874, Cl. 220-89.00A.
Muller, Hans: *See*—
May, Stefan; and Muller, Hans, 4,513,992, Cl. 283-94.000.
Muller, Rolf, to Papst Motoren GmbH & Co KG. Small size electric motor. 4,514,654, Cl. 310-216.000.
Mumford, Eustace H., to Owens-Illinois, Inc. Glass feeder tube support. 4,514,209, Cl. 65-328.000.
Mundie, Craig J.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.
Murai, Yoshikazu: *See*—
Sato, Atsushi; Murai, Yoshikazu; Goto, Masahito; and Mochizuki, Kanji, 4,514,229, Cl. 106-135.000.
Murakami, Susumu: *See*—
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, 4,514,747, Cl. 357-38.000.
Murakawa, Tetsuya: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,514,429, Cl. 426-535.000.
Muramatsu, Shigeru; Fujiwara, Yuji; Hayashida, Hazime; and Yamamoto, Jun, to Nippon Gakki Seizo Kabushiki Kaisha. Solenoid actuator for use in automatic performance piano. 4,513,652, Cl. 84-20.000.
Muramoto, Kazuo: *See*—
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, 4,514,810, Cl. 364-424.000.
Murata, Kazuou: *See*—
Makino, Hiroshi; Higuchi, Masaru; and Murata, Kazuou, 4,514,084, Cl. 356-4.000.
Murata Manufacturing Co., Ltd.: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.
Sakamoto, Yukio; and Tanabe, Takeshi, 4,514,782, Cl. 361-306.000.
Murata, Taneo, to Alps Electric Co., Ltd. Locking type pushbutton switch. 4,514,608, Cl. 200-153.00J.
Murayama, Masaki; and Iida, Manjiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transfer system for a data processing system provided with direct memory access units. 4,514,808, Cl. 364-200.000.
Murphy, Francis X.: *See*—
Voigt, H. William; and Murphy, Francis X., 4,514,239, Cl. 149-18.000.
Murphy, Kevin M.: *See*—
Lawrenson, Jack; and Murphy, Kevin M., 4,513,543, Cl. 51-283.00R.
Murphy, William. Horseshoe full pad. 4,513,825, Cl. 168-12.000.
Murray Corporation: *See*—
Proctor, Robert H.; and Hobbs, Arthur G., Jr., 4,513,578, Cl. 62-149.000.
Murray, Joseph; and Guthrie, Jesse. Climbing aid retriever. 4,513,641, Cl. 81-486.000.
Murray, William V.; Clum, Charles E.; and Lukenbach, Elvin R., to Johnson & Johnson Baby Products Company. Sunscreen compositions containing vinylogous amides. 4,514,383, Cl. 424-59.000.
Musashi Engineering Kabushiki Kaisha: *See*—
Asai, Mamoru; Mitani, Tsuneyoshi; and Ookawa, Hiroyuki, 4,514,856, Cl. 377-8.000.
Musits, Bela L.: *See*—
Hollis, Ralph L., Jr.; and Musits, Bela L., 4,514,674, Cl. 318-687.000.
Muss, Manfred: *See*—
Wochnowski, Waldemar; Hohm, Reinhard; Liebe, Reinhard; and Muss, Manfred, 4,513,759, Cl. 131-303.000.
Mutzberg, Friedhelm: *See*—
Riemer, Heinz; Weiss, Joern-Volker; and Mutzberg, Friedhelm, 4,514,467, Cl. 428-413.000.
N P K "Zavarachna Technika": *See*—
Tzvetanov, Plamen V.; Chankov, Dyanko V.; Nikolov, Orlin A.; and Ivanov, Alexander L., 4,513,902, Cl. 228-25.000.
N. V. Raychem S.A.: *See*—
Maukola, Pekka J., 4,514,241, Cl. 156-79.000.
Nagamoto, Mitsuki; and Kubota, Takuo, to Matsushita Electric Works, Ltd. AC Drive electromagnetic relay. 4,514,711, Cl. 335-243.000.
Nagasaka, Nobuyuki; and Momoshima, Yukichi, to Kabushiki Kaisha Daini Seikosha. Electronic musical instrument. 4,513,650, Cl. 84-1.030.
Nagato, Hitoshi; Izawa, Koji; and Hirahara, Shuzo, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal recording system. 4,514,738, Cl. 346-76.0PH.
Naito, Yukio: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
Nakabu, Shigeo: *See*—
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katunobu, 4,514,042, Cl. 350-331.00R.
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, to Kuraray Co., Ltd. Woven fabric having a velvety appearance. 4,514,459, Cl. 428-229.000.
Nakagawa, Kazuyuki: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,514,401, Cl. 514-253.000.
Nakai, Mamoru; Iwata, Fumio; and Inoue, Teruhiko, to UBE Industries, Ltd. Process for the preparation of urea derivatives. 4,514,571, Cl. 546-306.000.
Nakai, Masaaki: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.

Nakajima, Toyohei: *See*—
Koumura, Takashi; and Nakajima, Toyohei, 4,513,713, Cl. 123-339.000.
Nakajima, Yoshihisa: *See*—
Yokomori, Shinji; and Nakajima, Yoshihisa, 4,513,762, Cl. 133-3.00R.
Nakamura, Kenji: *See*—
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, 4,513,702, Cl. 123-193.00H.
Nakamura, Kensaku. Synthetic resin extruding means. 4,514,163, Cl. 425-204.000.
Nakamura, Teruo; and Fukuda, Shoichi, to Diesel Kiki Company, Ltd. Rotary vane compressor. 4,514,157, Cl. 418-259.000.
Nakano, Gregory: *See*—
Wilger, John F.; Nakano, Gregory; and Berman, William A., 4,513,542, Cl. 51-241.00S.
Nakano, Kunimitsu; Chuzawa, Takaaki; and Ohmuro, Masaru, to Matsushita Electric Works, Ltd. Circuit breaker. 4,514,709, Cl. 335-201.000.
Nakano Vinegar Co., Ltd.: *See*—
Fujiyama, Seiichi; Minakami, Hiroyuki; and Masai, Hiroshi, 4,514,563, Cl. 536-123.000.
Nakano, Walter S.: *See*—
Halford, Wayne R.; and Nakano, Walter S., 4,513,967, Cl. 273-108.000.
Nakayama, Toyoo: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.
Nalco Chemical Company: *See*—
Wang, Sophia; Roof, Glenn L.; and Porlier, Beth W., 4,514,286, Cl. 208-196.000.
Nancarrow, James N.: *See*—
Cholvin, Robert L.; McInerney, Charles E.; Nancarrow, James N.; and Gantz, Jack L., 4,513,730, Cl. 123-564.000.
Narita, Ko: *See*—
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,513,716, Cl. 123-425.000.
Narita, Seiichi: *See*—
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,513,628, Cl. 73-862.340.
Nash, Stephen E.: *See*—
Bentley, Gustavus A.; Nash, Stephen E.; and Pichler, Gerald P., 4,513,976, Cl. 277-25.000.
Natarajan, Sesha I.: *See*—
Gordon, Eric M.; Godfrey, Jollie D., Jr.; and Natarajan, Sesha I., 4,514,391, Cl. 514-2.000.
Nath, Prem; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Upstream cathode assembly. 4,513,684, Cl. 118-718.000.
Nath, Prem, to Energy Conversion Devices, Inc. Apparatus for plasma assisted evaporation of thin films and corresponding method of deposition. 4,514,437, Cl. 427-39.000.
National Distillers and Chemical Corporation: *See*—
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,535, Cl. 524-109.000.
Braus, Harry; Barlow, Anthony; and Maringer, Melvin F., 4,514,536, Cl. 524-261.000.
Smith, David W., 4,514,521, Cl. 518-700.000.
National Research Development Corporation: *See*—
Berry, Paul S.; Benson, John A.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,513,689, Cl. 119-82.000.
Smith, Kenneth C. A.; and Erasmus, Stephen J., 4,514,629, Cl. 250-311.000.
NCR Corporation: *See*—
Schaefer, William J., Jr., 4,513,957, Cl. 271-90.000.
Neal, James W.: *See*—
Loersch, Joseph F.; and Neal, James W., 4,514,469, Cl. 428-553.000.
Negishi, Kiyoshi; Kawasaki, Masahiro; and Tano, Eiichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic control apparatus for photographic camera. 4,514,075, Cl. 354-446.000.
Negishi, Takao; and Kojima, Teiryo, to Toray Industries, Inc. Sewing thread. 4,513,565, Cl. 57-236.000.
Nelander, Curt, to AB Rollab. Method and device for attaining a gas flow in a wind tunnel. 4,513,610, Cl. 73-147.000.
Nelson, Bradley B.; and Nelson, Gregory T. Weighted exercising device. 4,513,963, Cl. 272-128.000.
Nelson, Gregory T.: *See*—
Nelson, Bradley B.; and Nelson, Gregory T., 4,513,963, Cl. 272-128.000.
Nestec, S.A.: *See*—
Cabi-Akman, Robert, 4,513,882, Cl. 222-56.000.
Nestle & Fischer: *See*—
Fischer, Walter, 4,513,512, Cl. 33-471.000.
Neubauer, Wilhelm; and Werner, Hans, to Werner and Pfleiderer. Apparatus for processing viscous substances or substances which become viscous through processing. 4,514,090, Cl. 366-91.000.
Neumann, Albert. Earth retaining wall system. 4,514,113, Cl. 405-286.000.
Newnham, Robert C.: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.
Nguyen, Tuan A.: *See*—
Federico, Anthony M.; Legg, Ernest L.; and Nguyen, Tuan A., 4,514,846, Cl. 371-16.000.
NHK Spring Co., Ltd.: *See*—
Yajima, Toshio, 4,513,846, Cl. 188-380.000.
Ni, Yang-Chou M.: *See*—
Darcangelo, Charles M.; Montierth, Max R.; and Ni, Yang-Chou M., 4,514,205, Cl. 65-12.000.
Nibco Inc.: *See*—
Shaefer, Robert R.; and Matthews, Kenneth J., 4,514,244, Cl. 156-158.000.
Niccum, Phillip K.; and Bunn, Dorrance P., Jr., to Texaco Inc. Catalytic cracking system. 4,514,285, Cl. 208-148.000.
Nicholson, Terence P. Cylinder head gasket. 4,513,978, Cl. 277-235.00B.
Nied, Herman A., to General Electric Company. Composite resistance spot welding electrode. 4,514,612, Cl. 219-119.000.
Niehaus, Norbert; Friehe, Werner; and Schwenk, Wilhelm, to Mannesmann Aktiengesellschaft. Method for electrolytically tin plating articles. 4,513,995, Cl. 285-55.000.
Niemela , Pekka. Sledge or equivalent transporting base. 4,513,982, Cl. 280-26.000.
Nieminski, Robert A.; and Hinde, Walter R., to Yale Materials Handling Corporation. Disc brake arrangement for steering and traction unit. 4,513,839, Cl. 180-253.000.
Niessen, Carl O. Massage unit. 4,513,738, Cl. 128-57.000.
Nifco Inc.: *See*—
Omata, Nobuaki, 4,513,473, Cl. 16-82.000.
Nigol, Olaf; and Barrett, John S. Method of heat treating steel wire. 4,514,237, Cl. 148-142.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; and Shiokawa, Kozo, 4,514,210, Cl. 71-92.000.
Saito, Junichi; and Kagabu, Shinzo, 4,514,418, Cl. 514-508.000.
Nikolayczik, Hans, to American Standard Inc. Sanitary single-control mixer fitting. 4,513,781, Cl. 137-625.410.
Nikolov, Orlin A.: *See*—
Tzvetanov, Plamen V.; Chankov, Dyanko V.; Nikolov, Orlin A.; and Ivanov, Alexander L., 4,513,902, Cl. 228-25.000.
Nillesen, Antonius H. H. J.; and Welles, Petrus W. G., to U.S. Philips Corporation. Digital color television signal processing circuit. 4,514,754, Cl. 358-13.000.
Nippon Cable System, Inc.: *See*—
Teraura, Makoto, 4,513,680, Cl. 114-159.000.
Nippon Electric Co., Ltd.: *See*—
Kimoto, Manabu, 4,514,804, Cl. 364-200.000.
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,514,742, Cl. 346-140.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Muramatsu, Shigeru; Fujiwara, Yuji; Hayashida, Hazime; and Yamamoto, Jun, 4,513,652, Cl. 84-20.000.
Nippon GT Corporation: *See*—
Yoshida, Yasuhisa; and Ohi, Toshio, 4,513,570, Cl. 60-529.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Sato, Giichi; Matuo, Tadashi; and Tabei, Tooru, 4,514,559, Cl. 534-690.000.
Nippon Kogaku K. K.: *See*—
Hamanishi, Yoshinari, 4,514,051, Cl. 350-465.000.
Nippon Oil Co., Ltd.: *See*—
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,514,287, Cl. 208-309.000.
Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Murai, Yoshikazu; Goto, Masahito; and Mochizuki, Kanji, 4,514,229, Cl. 106-135.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,514,156, Cl. 418-173.000.
Umeha, Genkichi; and Hiraoka, Takeshi, 4,513,977, Cl. 277-96.200.
Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; and Yoshinaga, Toru, 4,514,657, Cl. 313-130.000.
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,513,628, Cl. 73-862.340.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, 4,513,626, Cl. 73-862.340.
Nippon Steel Corporation: *See*—
Kimoto, Tetsuo; and Orita, Kiyoshi, 4,513,597, Cl. 72-53.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Miyaguchi, Shoji, 4,514,592, Cl. 178-22.110.
Nippondenso Co., Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,513,628, Cl. 73-862.340.
Nippondenso Co., Ltd.: *See*—
Haraguchi, Hiroshi; Narita, Ko; and Iwata, Toshiharu, 4,513,716, Cl. 123-425.000.
Ito, Yoji; Inoue, Yozo; Hara, Kiyoshi; Muramoto, Kazuo; and Miura, Kunio, 4,514,810, Cl. 364-424.000.
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.

Takenaka, Akihiko; Arakawa, Miyao; Sato, Masahiro; and Yamaguchi, Toshiyuki, 4,513,609, Cl. 73-116.000.
Nisato, Dino; and Boveri, Sergio, to Sanofi. N-substituted nicotinamide 1-oxide as histamine H_2 receptor blockers. 4,514,408, Cl. 514-212.000.
Nishigaki, Kenichi, to Mitsubishi Kinzoku Kabushiki Kaisha. Tough carbide base cermet. 4,514,224, Cl. 75-238.000.
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Control mechanism for selective creep of an automatic transmission. 4,513,638, Cl. 74-866.000.
Nishio, Tadashi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.
Nishitani, Kimio: *See*—
Imoda, Kinichiro; Kawai, Toshinori; and Nishitani, Kimio, 4,513,921, Cl. 242-36.000.
Nissan Motor Company, Limited: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,513,835, Cl. 180-142.000.
Ohtsuka, Kunio, 4,513,634, Cl. 74-688.000.
Sasaki, Masafumi; Kashiwagi, Susumu; and Hiyoshi, Takanori, 4,513,569, Cl. 60-39.310.
Yanagishima, Takayuki; and Kasai, Junichi, 4,514,599, Cl. 179-181.00W.
Nisshin Flour Milling Co., Ltd.: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.
Nitivy Co., Ltd.: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Nitschke, Dean M., to Glasstech, Inc. Apparatus for bending glass sheets. 4,514,208, Cl. 65-273.000.
Nitta, Koichi: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.
Nitto Chemical Industry Co., Ltd.: *See*—
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, 4,514,551, Cl. 526-233.000.
Niwa, Masatake: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.
Nixdorf Computer AG: *See*—
Roschlein, Rolf; and Schulte, Heinz, 4,514,743, Cl. 346-140.00R.
Nogi, Tatsuo. Parallel computer. 4,514,807, Cl. 364-200.000.
Noguchi, Tetsuo: *See*—
Yamahira, Yoshiya; Shima, Katsuhiko; Matsusaka, Chikako; and Noguchi, Tetsuo, 4,514,386, Cl. 424-81.000.
Noji, Tasuku; and Tobita, Katsumi, to Alps Electric Co., Ltd. CATV selection device. 4,514,757, Cl. 358-86.000.
Nojiri, Takeo; and Irie, Yasuo, to Mitsui Engineering & Shipbuilding Co., Ltd. Propeller for ship. 4,514,146, Cl. 416-200.00R.
Noll, Lee A., to Corning Glass Works. Cell culture using a monolithic support. 4,514,499, Cl. 435-240.000.
Nolte, Lothar: *See*—
Roselt, Udo; Nolte, Lothar; and Pohler, Manfred, 4,514,206, Cl. 65-108.000.
Nomoto, Tsugio: *See*—
Ichizawa, Yoshiyuki; Nomoto, Tsugio; and Oshida, Mamoru, 4,514,166, Cl. 425-436.00R.
Noordam, Arend, to Shell Oil Company. 2-Hydroxypropane sulphonic acid derivatives: their preparation and curable compositions thereof. 4,514,547, Cl. 525-510.000.
Nordling, Karl I., to Kinex Corporation. High speed digital modem. 4,514,825, Cl. 364-900.000.
Nordson Corporation: *See*—
Hollingsworth, Alexander, 4,513,560, Cl. 53-509.000.
Nordstrom, Lennart, to Saab-Scania Aktiebolag. Attitude director indicator. 4,513,509, Cl. 33-330.000.
Norgard, Michael V.: *See*—
Kettman, John R.; and Norgard, Michael V., 4,514,498, Cl. 435-240.000.
Norris, Philip R., to Polaroid Corporation. Film assemblage including a cannister for housing a film cassette during processing of film. 4,514,070, Cl. 354-313.000.
North American Philips Corporation: *See*—
Lentz, James M., 4,514,600, Cl. 200-5.00R.
Zola, John, 4,514,247, Cl. 156-250.000.
Northern Telecom Limited: *See*—
Rosenbaum, Stanley D.; and Handforth, Martin R., 4,514,595, Cl. 179-16.00F.
Shannon, Michael A.; and Howat, Robert J., 4,514,435, Cl. 427-8.000.
Sims, Dewey M., Jr., 4,514,774, Cl. 360-95.000.
Norton Company: *See*—
Gow, Robert J., 4,513,546, Cl. 52-172.000.
Noto, Peter; and Reid, Michael, to Garan, Inc. Method and apparatus for coordination of garments. 4,514,178, Cl. 434-395.000.
Novagene, Ltd.: *See*—
Kit, Malon; and Kit, Saul, 4,514,497, Cl. 435-235.000.
Novak, W. Thomas, to Micronix Partners. Lithography system. 4,514,858, Cl. 378-034.000.
Nowicki, Ronald S.; and Moulder, John F., to Perkin-Elmer Corporation, The. Integrated circuit metallization technique. 4,513,905, Cl. 228-123.000.
Nowobilski, Jeffert J.; and Owens, William J., to Union Carbide Corporation. Peg supported thermal insulation panel. 4,514,450, Cl. 428-120.000.
Nowogrodzki, Markus; and Mawhinney, Daniel D., to RCA Corporation. Dual frequency heart rate monitor utilizing doppler radar. 4,513,748, Cl. 128-653.000.
Nozawa, Ryoichiro; and Kawamura, Hideaki, to Fanuc Ltd. System for correcting positional error in numerical control devices. 4,514,813, Cl. 364-474.000.
Nozawa, Takamitsu: *See*—
Taguchi, Toshio; Akino, Hisashi; and Nozawa, Takamitsu, 4,513,877, Cl. 220-335.000.
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katunobu, to Sharp Kabushiki Kaisha. Thin structure of display panel. 4,514,042, Cl. 350-331.00R.
Null, Michael W.: *See*—
Miller, Ira; and Null, Michael W., 4,514,651, Cl. 307-475.000.
Nunomura, Shigeki: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.
Nunose, Akira: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
Nuovo Pignone S.p.A.: *See*—
Zanobini, Alessandro, 4,513,813, Cl. 165-111.000.
Nussbaumer, Manfred; Beitinger, Eberhard; and Mohlenbrink, Wolfgang, to Ed. Zublin Aktiengesellschaft. Method for determining the position of a pressed-ahead hollow-section line, and apparatus for implementing the method. 4,513,504, Cl. 33-1.00H.
Nuzillat, Gerard; and Bert, Georges, to Thomson-CSF. High-entrance high-speed logic operator which has a complex digital function and utilizes at least one quasi-normally off MESFET. 4,514,649, Cl. 307-450.000.
N.V. Bekaert S.A.: *See*—
Uytterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, 4,514,520, Cl. 502-337.000.
Nyboer, Duane A., to Mechanical Transplanter Company. Machine for laying film material. 4,513,530, Cl. 47-9.000.
Obara, Hideo: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,514,740, Cl. 346-139.00R.
Obata, Haruyuki: *See*—
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Obayashi, Hidehito: *See*—
Kimura, Takashi; Mochiji, Kozo; and Obayashi, Hidehito, 4,514,857, Cl. 378-034.000.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, to Nippon Soken, Inc. Torque detector. 4,513,626, Cl. 73-862.340.
Obayashi, Hideki: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Kohama, Tokio; Obayashi, Hideki; Ina, Toshikazu; and Narita, Seiichi, 4,513,628, Cl. 73-862.340.
Oberstein, Karla; and Thilo, Peer, to Siemens Aktiengesellschaft. Method and apparatus for increasing the response sensitivity and the interference resistance in an alarm system. 4,514,720, Cl. 340-511.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E.; and Shaler, John E., 4,513,665, Cl. 102-312.000.
Oce-Helioprint AS: *See*—
Sigvardt, Niels H.; and Baranski, Jan A., 4,513,956, Cl. 271-9.000.
Ochi, Hisayuki: *See*—
Ushiyama, Hisayuki; Ochi, Hisayuki; Miyamae, Tatsuo; and Wakamiya, Katsutoshi, 4,514,485, Cl. 430-106.600.
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Thiazolylacetamido cephalosphorin compounds. 4,514,565, Cl. 544-25.000.
Odagiri, Masaru: *See*—
Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, 4,514,451, Cl. 428-141.000.
Ode, Bengt: *See*—
Borrman, Bo; Hellman, Erik; Ode, Bengt; and van Santen, Aart, 4,514,358, Cl. 376-362.000.
Oestmann, Eldon D.: *See*—
Balzer, David J.; Dennison, Thomas M.; Getz, Marvin G.; and Oestmann, Eldon D., 4,514,014, Cl. 305-10.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,514,371, Cl. 423-449.000.
Oficina Technica HGB: *See*—
Vadasz, Amnon F., 4,513,778, Cl. 137-533.110.

Ogano, Takeo: *See*—
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, 4,513,702, Cl. 123-193.00H.
Ogata, Yukihiko: *See*—
Tateoka, Masamichi; and Ogata, Yukihiko, 4,514,626, Cl. 250-235.000.
Ogawa, Hidenori: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,514,401, Cl. 514-253.000.
Ogawa, Hirotoshi: *See*—
Ueda, Tomoyuki; and Ogawa, Hirotoshi, 4,513,949, Cl. 251-266.000.
Ogawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Rotary vane pump with packing means for the housing components. 4,514,155, Cl. 418-149.000.
Ogawa, Shigeo: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Ogawa, Yasuo: *See*—
Furuno, Akihisa; Inukai, Kenichi; and Ogawa, Yasuo, 4,514,551, Cl. 526-233.000.
Ogren, John R.: *See*—
Blumenthal, Jack L.; Ogren, John R.; Rutkowski, Eugene V.; and Appel, Marvin, 4,514,698, Cl. 330-4.300.
O'Gwynn, David C., to Ampex Corporation. Adaptive apparatus and method for control. 4,514,672, Cl. 318-616.000.
Ohba, Shinya: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, 4,514,766, Cl. 358-213.000.
Ohi, Toshio: *See*—
Yoshida, Yasuhisa; and Ohi, Toshio, 4,513,570, Cl. 60-529.000.
Ohkawa, Nobuhisa: *See*—
Kobayashi, Nobuyuki; Ito, Hiroshi; and Ohkawa, Nobuhisa, 4,513,710, Cl. 123-339.000.
Ohkubo, Shoichi: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, 4,514,525, Cl. 521-112.000.
Ohmuro, Masaru: *See*—
Nakano, Kunimitsu; Chuzawa, Takaaki; and Ohmuro, Masaru, 4,514,709, Cl. 335-201.000.
Ohnuki, Tetsuo: *See*—
Takamatsu, Takashi; and Ohnuki, Tetsuo, 4,514,152, Cl. 418-61.00B.
Ohsumi, Tadashi; Hatakoshi, Makoto; and Kisida, Hirosi, to Sumitomo Chemical Company, Limited. Oxime ethers and their use. 4,514,406, Cl. 514-352.000.
Ohtani, Masaaki: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; and Ohkubo, Shoichi, 4,514,525, Cl. 521-112.000.
Ohtsuka, Kunio, to Nissan Motor Company, Limited. Change-speed transmission with selective bypass of hydrokinetic unit. 4,513,634, Cl. 74-688.000.
Oikawa, Hiroshi: *See*—
Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, 4,513,753, Cl. 128-706.000.
Oikawa, Saburo: *See*—
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, 4,514,747, Cl. 357-38.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,513,929, Cl. 242-198.000.
Oji Paper Company, Ltd.: *See*—
Kita, Yukio; Koide, Kazuo; and Horiko, Kouki, 4,514,501, Cl. 435-251.000.
Oka, Tateki: *See*—
Wada, Kenichi; Oka, Tateki; and Tabuchi, Kenji, 4,514,480, Cl. 430-30.000.
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Optical input and output scanning system. 4,514,079, Cl. 355-8.000.
Okada, Taiiti: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.
Okada, Tomoo, to Kabushiki Kaisha Universal. Device for holding display plate for game machine. 4,513,968, Cl. 273-143.00R.
Okamura Corporation: *See*—
Abe, Masatoshi, 4,514,136, Cl. 414-744.00A.
Okamura, Masahiro: *See*—
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, 4,514,747, Cl. 357-38.000.
Okazaki, Mari: *See*—
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.
Okazaki, Shinji: *See*—
Sawa, Natsuo; Suzuki, Toshihiro; and Okazaki, Shinji, 4,514,556, Cl. 528-117.000.
Okimoto, Haruo: *See*—
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,513,707, Cl. 123-242.000.
Okuda, Yoshiro: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,514,216, Cl. 75-0.5AA.
Okutome, Toshiyuki: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.
Olin Corporation: *See*—
Woodard, Kenneth E., Jr.; and Dotson, Ronald L., 4,513,904, Cl. 228-116.000.
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, to Oy Partek AB. Method and apparatus for the classification of piece goods which are in a state of motion. 4,514,816, Cl. 364-478.000.
Olsen, Willi; Padderatz, Heinz; Palm, Joachim; and Pircher, Christian, to Siemens Aktiengesellschaft. Encapsulated, compressed-gas-insulated, high-voltage switching installation. 4,514,783, Cl. 361-336.000.
Olson, Harold D.; Addison, Charles; and Cagle, J. Douglas, to Cagle's, Inc. Apparatus for processing poultry. 4,513,476, Cl. 17-44.100.
Olson, Raymond N., to Sundstrand Corporation. Liquid cooled high speed synchronous machine. 4,514,652, Cl. 310-54.000.
Olympus Optical Company Ltd.: *See*—
Fukuoka, Kenji, 4,514,083, Cl. 356-1.000.
Mizokami, Kazunori, 4,514,074, Cl. 354-416.000.
Omaki, Takanobu: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.
Omata, Nobuaki, to Nifco Inc. Sealed rotary motion damper. 4,513,473, Cl. 16-82.000.
Omco Inc.: *See*—
Agbay, Anthony J., 4,513,592, Cl. 70-34.000.
Carlson, John H.; and Agbay, Anthony J., 4,513,591, Cl. 70-34.000.
OMI International Corporation: *See*—
Lash, Ronald J., 4,514,267, Cl. 204-44.200.
Omnes, Jacqueline: *See*—
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,514,371, Cl. 423-449.000.
O'Neal, Douglas M.: *See*—
Mendelson, Richard N.; O'Neal, Douglas M.; and Sharp, Leo A., Jr., 4,514,823, Cl. 364-900.000.
Ono, Kimizo: *See*—
Abe, Hiroshi; Sato, Nobuhiro; Ono, Kimizo; and Hirano, Kazuo, 4,513,751, Cl. 128-666.000.
Ooba, Kaoru: *See*—
Shiraiwa, Toshiyuki; and Ooba, Kaoru, 4,514,721, Cl. 340-527.000.
Ookawa, Hiroyuki: *See*—
Asai, Mamoru; Mitani, Tsuneyoshi; and Ookawa, Hiroyuki, 4,514,856, Cl. 377-8.000.
Opresco, Ovidiu; and Marinesco, Jon D. Polymorphic twist puzzle. 4,513,970, Cl. 273-153.00S.
Opresko, Stephen T., to RCA Corporation. Cathode-ray tube having an electron gun assembly with a bimetal cathode eyelet structure. 4,514,660, Cl. 313-446.000.
Orelup, Richard B., to Morton Norwich Products. Reagent and process for detecting furfural in petroleum products. 4,514,503, Cl. 436-60.000.
Orita, Kiyoshi: *See*—
Kimoto, Tetsuo; and Orita, Kiyoshi, 4,513,597, Cl. 72-53.000.
Oritani, Atsushi, to Fujitsu Limited. Static-type semiconductor memory device. 4,514,831, Cl. 365-203.000.
Orogil: *See*—
Le Coent, Jean-Louis, 4,514,313, Cl. 252-42.700.
Osakeyhtio, A. Ahlstrom: *See*—
Enqvist, Johan R., 4,514,297, Cl. 210-194.000.
Oshida, Mamoru: *See*—
Ichizawa, Yoshiyuki; Nomoto, Tsugio; and Oshida, Mamoru, 4,514,166, Cl. 425-436.00R.
Osman, Maged A.: *See*—
Tuong, Huynh-Ba; Kelly, Stephen M.; and Osman, Maged A., 4,514,317, Cl. 252-299.620.
Osrodek Badawczo-Rozwojowy Aparatury Mleczarskiej: *See*—
Balinski, Ryszard; and Sokulski, Marek, 4,513,658, Cl. 99-485.000.
Ostbergs Fabriks AB: *See*—
Lindblom, Thore; Hedin, Jan-Erik; and Wickstrom, Sven, 4,513,799, Cl. 144-379.000.
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, to BASF Aktiengesellschaft. Gastric acid secretion inhibiting N-(imidazol-1-ylalkyl)thiourea derivatives. 4,514,413, Cl. 514-397.000.
Otis Engineering Corporation: *See*—
Adams, James B., Jr., 4,513,944, Cl. 251-89.000.
Yonker, John H., 4,513,764, Cl. 137-68.00R.
Otocki, Tadeusz S., to Protectaire Systems Co. Positive drive rotator. 4,513,682, Cl. 118-322.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,514,401, Cl. 514-253.000.
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Electromagnetic reed valve. 4,513,945, Cl. 251-129.000.
Otto Bock Orthopadische Industrie KG: *See*—
Glabiszewski, Richard, 4,513,457, Cl. 3-15.000.
Ovren, Christer: *See*—
Adolfsson, Morgan; Brogardh, Iorgny; Hok, Bertil; and Ovren, Christer, 4,514,860, Cl. 455-612.000.

Owatonna Manufacturing Company, Inc.: *See*—
Macht, Jon A., 4,514,007, Cl. 296-183.000.
Owen, Donald W. Switching apparatus. 4,514,602, Cl. 200-16.00C.
Owens-Corning Fiberglas Corporation: *See*—
Dunn, Charles S., 4,514,851, Cl. 373-27.000.
Owens-Illinois, Inc.: *See*—
Miller, Peter S.; and Hall, Maclin S., 4,514,812, Cl. 364-473.000.
Mumford, Eustace H., 4,514,209, Cl. 65-328.000.
Rhoads, Roger R., 4,513,860, Cl. 206-150.000.
Owens, William H.: *See*—
Hansen, Donald W., Jr.; Baran, John S.; and Owens, William H., 4,514,332, Cl. 260-112.50E.
Owens, William J.: *See*—
Nowobilski, Jeffert J.; and Owens, William J., 4,514,450, Cl. 428-120.000.
Owoc, James R.; Thomas, John H.; and Conley, Richard W., to Kerotest Manufacturing Corp. Metering valve. 4,513,779, Cl. 137-556.000.
Oxford, David B.: *See*—
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,514,828, Cl. 365-8.000.
Oy Partek AB: *See*—
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, 4,514,816, Cl. 364-478.000.
Oy Tampella AB: *See*—
Issakainen, Onni, 4,514,111, Cl. 405-260.000.
Oyanagi, Shigeru: *See*—
Iwata, Kazuhide; Shibayama, Shigeki; Hidai, Yutaka; and Oyanagi, Shigeru, 4,514,826, Cl. 364-900.000.
Paap, Hans J.: *See*—
Richter, Albert P., Jr.; Campsey, Ronald L.; Paap, Hans J.; and Bussian, Alfred E., 4,514,627, Cl. 250-255.000.
Pacesetter Systems, Inc.: *See*—
Weyant, Robert R., 4,513,752, Cl. 128-696.000.
Packham, Charles C.: *See*—
Majthan, Rudolf; Stuhler, Rolf; Parsonage, Raymond G.; and Packham, Charles C., 4,514,618, Cl. 219-370.000.
Padderatz, Heinz: *See*—
Olsen, Willi; Padderatz, Heinz; Palm, Joachim; and Pircher, Christian, 4,514,783, Cl. 361-336.000.
Pagdin, Brian C.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.
Pahl, Joachim: *See*—
Kaeufer, Helmut; Rautenberg, Lutz; and Pahl, Joachim, 4,514,351, Cl. 264-210.200.
Paikoff, Myron: *See*—
Hain, Robert W.; Hadtke, Frederick B.; and Paikoff, Myron, 4,513,891, Cl. 222-213.000.
Palm, Joachim: *See*—
Olsen, Willi; Padderatz, Heinz; Palm, Joachim; and Pircher, Christian, 4,514,783, Cl. 361-336.000.
Palmer, John P.; and Ward, Phillip B., Jr., to General Dynamics Pomona Division. Fiber optic coupler array and fabrication method. 4,514,057, Cl. 350-96.150.
Pan, Wie-Hin: *See*—
Ho, Teh C.; and Pan, Wie-Hin, 4,514,517, Cl. 502-220.000.
Pandrol Ltd.: *See*—
Schumaker, Jon S., 4,513,912, Cl. 238-349.000.
Paolillo, Roger E.: *See*—
Deveau, Paul J.; Greenberg, Paul B.; and Paolillo, Roger E., 4,513,567, Cl. 60-39.020.
Papalos, John G.; and Sinka, Joseph V., to Diamond Shamrock Chemicals Company. Carbonaceous materials water mixtures. 4,514,189, Cl. 44-51.000.
Papst, Georg; Wrobel, Guenter; and Koletzki, Ulrich, to Papst-Motoren GmbH & Co. KG. Heat sink for electronic devices. 4,513,812, Cl. 165-80.00B.
Papst Motoren GmbH & Co KG: *See*—
Muller, Rolf, 4,514,654, Cl. 310-216.000.
Papst-Motoren GmbH & Co. KG: *See*—
Papst, Georg; Wrobel, Guenter; and Koletzki, Ulrich, 4,513,812, Cl. 165-80.00B.
Pardon, David W.: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.
Parker, Gregory H. Insulated window cover apparatus. 4,513,548, Cl. 52-202.000.
Parker, Paul: *See*—
Vanderminden, Robert D.; and Parker, Paul, 4,514,009, Cl. 297-27.000.
Parkhouse, Alan: *See*—
Kerner, Dieter; Kleinschmit, Peter; Parkhouse, Alan; and Wolff, Siegfried, 4,514,231, Cl. 106-309.000.
Parmentier, Paul, to U.S. Philips Corporation. Method of manufacturing an identification card and an identification manufactured, by this method. 4,514,785, Cl. 361-401.000.
Parry, Anthony N.: *See*—
Denholm, William T.; Floyd, John M.; Errington, William J.; and Parry, Anthony N., 4,514,222, Cl. 75-77.000.
Parshall, David G., to AMSTED Industries Incorporated. Continuous media filter. 4,514,301, Cl. 210-400.000.
Parson, Roger F.; Rosenquist, Kenneth G.; and Schmit, Justin M., to Jeno's, Inc. Dispensing apparatus. 4,513,918, Cl. 241-101.400.
Parsonage, Raymond G.: *See*—
Majthan, Rudolf; Stuhler, Rolf; Parsonage, Raymond G.; and Packham, Charles C., 4,514,618, Cl. 219-370.000.
Passmore, David T.; and Windibank, Brian P., to Eastman Kodak Company. Alkyd composition for high solids coatings. 4,514,230, Cl. 106-243.000.
Pasternack, George: *See*—
Bishop, Timothy E.; Stanton, Joseph J.; Pasternack, George; and Cutler, Orvid R., Jr., 4,514,037, Cl. 350-96.230.
Patchen, Paul, II, to Allis-Chalmers Corporation. Intercooler bypass return in an internal combustion engine. 4,513,695, Cl. 123-41.100.
Paterson, Linda M.: *See*—
Symons, Edward A.; Rolston, John H.; Clermont, Michel J.; and Paterson, Linda M., 4,514,377, Cl. 423-648.00A.
Pato, Carlos M., to Monarch Wine Co., Inc. Method of and apparatus for controlling the quantity of filter aid fed to a sediment filter so as to maintain virtually constant a preselected optimum specific cake resistance. 4,514,306, Cl. 210-740.000.
Paul Hettich & Co.: *See*—
Sundermeier, Gunter; and Waltemate, Dieter, 4,514,021, Cl. 312-291.000.
Paul, Volker: *See*—
Kuhle, Engelbert; Hagemann, Hermann; Paul, Volker; and Brandes, Wilhelm, 4,514,417, Cl. 514-482.000.
Paul Wurth S.A.: *See*—
Legille, Edouard; Mailliet, Pierre; and Lonardi, Emile, 4,514,129, Cl. 414-200.000.
Pauling, Horst: *See*—
Hanck, Alfred; and Pauling, Horst, 4,514,338, Cl. 260-429.900.
Pauls, Heinz W.: *See*—
Fraser-Reid, Bertram; and Pauls, Heinz W., 4,514,561, Cl. 536-18.700.
Payne, David G., to Tektronix, Inc. Probe cable assemblies. 4,514,022, Cl. 339-17.00F.
Paynton, Richard D. Filter and method of manufacturing. 4,514,585, Cl. 174-35.0GC.
Pearce, Richard M.: *See*—
Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,514,427, Cl. 426-271.000.
Peck, Michael C., to Union Camp Corporation. Water reducible polyamides. 4,514,540, Cl. 524-514.000.
Pedersen, Jan B., to Tortrix A/S. Winding machine for winding elongate members or cores. 4,513,920, Cl. 242-4.00B.
Pedrick, Joseph F.; and Spector, George. Band grips. 4,513,801, Cl. 152-213.00R.
Pelletier, Jean-Marc: *See*—
Simoneau, Raynald; Pelletier, Jean-Marc; Di Vincenzo, Antonio; and Boillot, Jean-Paul, 4,514,615, Cl. 219-132.000.
Pellicciari, Roberto: *See*—
Castagnola, Virginio; Frigerio, Giuliano E.; and Pellicciari, Roberto, 4,514,393, Cl. 260-397.100.
Penton, Harold R., to Ethyl Corporation. Polyphosphazene process. 4,514,550, Cl. 525-538.000.
Pepper, Robert B.; and Maples, James A., to Pepper, Robert B. Position sensing and indicating device. 4,514,817, Cl. 364-480.000.
Pere, Gerard; and Badaut, Roger, to Creusot-Loire. Motion conversion mechanism. 4,513,630, Cl. 74-60.000.
Perkin-Elmer Corporation, The: *See*—
Nowicki, Ronald S.; and Moulder, John F., 4,513,905, Cl. 228-123.000.
Perlstein, Jerome H.: *See*—
Scozzafava, Michael; Chen, Chin H.; Reynolds, George A.; and Perlstein, Jerome H., 4,514,481, Cl. 430-58.000.
Permobil AB: *See*—
Engman, Bo H. S., 4,513,832, Cl. 180-6.500.
Perry, Thomas J., to GTE Automatic Electric Inc. Duplex digital span transmission circuit arrangement. 4,514,844, Cl. 371-8.000.
Persbeck, Sven-Eric; and Almqvist, Bert, to Utvecklingsaktiebolaget Teccon. Method and arrangement for determination of values relating to the mass of a flow of material. 4,513,830, Cl. 177-1.000.
Petersen, Eric R.: *See*—
Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, 4,514,478, Cl. 429-196.000.
Petersen, Jurgen: *See*—
Bader, Edgar; Rohrbach, Gerd; Petersen, Jurgen; and Kittel, Ludwig, 4,514,840, Cl. 370-29.000.
Petersson, Stig A., to Boliden Aktiebolag. Method of producing lead from sulphidic lead raw-material. 4,514,217, Cl. 75-10.00R.
Petro-Canada Exploration, Inc.: *See*—
Filby, John E., 4,514,305, Cl. 210-703.000.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,514,320, Cl. 252-392.000.
Pettersson, Jan G. T.: *See*—
Karlsson, Hakan I.; and Pettersson, Jan G. T., 4,514,257, Cl. 162-49.000.
Pettersson, Ola, to KB Cold Isostatic Press Systems CIPS. Plant for cold isostatic pressing. 4,514,158, Cl. 425-78.000.
Pez, Guido P., to Allied Corporation. Group IVa metal hydride catalysts and preparation thereof. 4,514,337, Cl. 260-429.300.
Pham Van, Doan, to Alsthom-Atlantique. Compressed gas circuit breaker. 4,514,605, Cl. 200-148.00A.
Phillips Petroleum Company: *See*—
Beever, William H.; Shue, Robert S.; and Childers, Clifford W., 4,514,588, Cl. 174-52.0PE.
Martin, Joel L., 4,514,514, Cl. 502-121.000.

Pichler, Gerald P.: *See—*
Bentley, Gustavus A.; Nash, Stephen E.; and Pichler, Gerald P., 4,513,976, Cl. 277-25.000.

Pichon, Laurence; and Huignard, Jean P., to Thomson-CSF. Optical Fourier transformer device and optical correlator incorporating the said device. 4,514,038, Cl. 350-162.130.

Pickering, William: *See—*
Melocik, Grant C.; and Pickering, William, 4,514,665, Cl. 318-139.000.

Piepers, Harry, to U.S. Philips Corporation. Output amplifier for a transmitting tube. 4,514,700, Cl. 330-56.000.

Piepers, Harry C., to Meco Equipment Engineers B.V. Method and device for galvanically applying a metal coating on metal objects. 4,514,264, Cl. 204-15.000.

Pierburg GmbH & Co. KG.: *See—*
Sudbeck, Rainer; and Baumgartner, Hans, 4,514,153, Cl. 418-69.000.

Pierrel Spa: *See—*
Toscano, Luciano, 4,514,562, Cl. 536-7.200.

Pilat, John F.: *See—*
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Pilkington Brothers P.L.C.: *See—*
Lawrenson, Jack; and Murphy, Kevin M., 4,513,543, Cl. 51-283.00R.

Pinelli, Tazio; and Sebastiano, Francesco, to Societa' Italiana Vetro-Siv-S.p.A. Prismatic refractor for concentrating solar energy on a suitable collecting surface, of fixed position with respect to time. 4,514,040, Cl. 350-286.000.

Pinkerton Tobacco Company, The: *See—*
Pittman, Luther B.; Agner, Jennings M.; and Hunt, George F., 4,513,756, Cl. 131-111.000.

Pircher, Christian: *See—*
Olsen, Willi; Padderatz, Heinz; Palm, Joachim; and Pircher, Christian, 4,514,783, Cl. 361-336.000.

Pirker, Robert: *See—*
Augustin, Hubert; and Pirker, Robert, 4,514,235, Cl. 148-37.000.

Pittard, John E.: *See—*
Pritchard, Frederick D.; and Pittard, John E., 4,514,092, Cl. 366-136.000.

Pittet, Alan O.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Flavoring with furfuryl mercaptals. 4,514,429, Cl. 426-535.000.

Pittman, Luther B.; Agner, Jennings M.; and Hunt, George F., to Pinkerton Tobacco Company, The. Process of making tobacco pellets. 4,513,756, Cl. 131-111.000.

Pittsburgh-Des Moines Corporation: *See—*
Cliff, John O.; and Edwards, James, 4,513,547, Cl. 52-194.000.

Plank, Vernon G.: *See—*
Berthel, Robert O.; Plank, Vernon G.; Jones, Stephen H.; and Matthews, Anthony J., 4,514,758, Cl. 358-93.000.

Plasschaert, Paul E.; Landheer, Dolf; and Cobb, Harold W. Corona device. 4,514,781, Cl. 361-230.000.

Plate, John R., to Allis-Chalmers Corporation. Electrohydraulic power shift transmission system. 4,513,850, Cl. 192-3.580.

Plateau Products Corporation: *See—*
Chezem, Jimmie A.; and Burks, Gary E., 4,514,000, Cl. 292-338.000.

Playe, Patrice: *See—*
Beduchaud, Michel; and Playe, Patrice, 4,514,078, Cl. 355-3.0BE.

Plessey Incorporated: *See—*
Ledgerwood, Harry J., 4,513,899, Cl. 226-141.000.

Plessey Overseas Limited: *See—*
Garner, Geoffrey M.; and Salloway, Anthony J., 4,514,596, Cl. 179-84.00T.

Plice, Gerald W., to Shure Brothers, Inc. Microphone shock-mounting apparatus. 4,514,598, Cl. 179-146.00R.

Plies, Erich: *See—*
Lischke, Burkhard; Frosien, Juergen; Anger, Klaus; and Plies, Erich, 4,514,638, Cl. 250-492.200.

Plum, Hans: *See—*
Landsiedel, Horst; and Plum, Hans, 4,514,225, Cl. 106-15.050.

Plummer, Walter Allen, III: *See—*
Iblings, Jackson R., 4,513,484, Cl. 24-437.000.

Pohler, Manfred: *See—*
Roselt, Udo; Nolte, Lothar; and Pohler, Manfred, 4,514,206, Cl. 65-108.000.

Polaroid Corporation: *See—*
Carrera, Jacinto P., 4,514,065, Cl. 354-235.100.
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,514,069, Cl. 354-304.000.
Kisler, Semyon, 4,513,683, Cl. 118-620.000.
Norris, Philip R., 4,514,070, Cl. 354-313.000.
Rogers, Howard G., 4,514,048, Cl. 350-423.000.

Polaschegg, Hans-Dietrich: *See—*
Mathieu, Bernd; and Polaschegg, Hans-Dietrich, 4,514,295, Cl. 210-90.000.

Pollak-Banda, Erich: *See—*
John, Erich; and Pollak-Banda, Erich, 4,514,099, Cl. 384-100.000.

Pon, Francois; Voirin, Jean-Philippe; and Lucan, Andre, to Compagnie Internationale Pour L'Informatique Cii/Honeywell Bull (Societe Anonyme). Powder for developing latent images and a method of producing the powder. 4,514,484, Cl. 430-106.600.

Poorman, Richard M., to United States of America, National Aeronautics and Space Administration. Low gravity exothermic heating-/cooling apparatus. 4,513,810, Cl. 165-61.000.

Porlier, Beth W.: *See—*
Wang, Sophia; Roof, Glenn L.; and Porlier, Beth W., 4,514,286, Cl. 208-196.000.

Postier, Robert A.: *See—*
Forrer, Robert E.; and Postier, Robert A., 4,514,246, Cl. 156-264.000.

Poulin, Jean L., to Societe dite: USINES BEYER FRERES. Reduction gear system for twin screw extruding system. 4,514,164, Cl. 425-208.000.

Poupeau, Jean-Jacques: *See—*
Jamet, Jean; Poupeau, Jean-Jacques; Omnes, Jacqueline; and Le Pennec, Claude, 4,514,371, Cl. 423-449.000.

Powell, Stanley, to British Nuclear Fuels Limited. Gate assembly for ponds. 4,514,110, Cl. 405-104.000.

Poynor, Paul C.; and Burdett, Joseph W., to Conoca Inc. Hydrogen donor diluent cracking process. 4,514,282, Cl. 208-56.000.

Price, Frank C., to USM Corporation. Apparatus for feeding adhesive in rod form. 4,513,886, Cl. 222-146.500.

Priese, Werner K., to Rockwell International Corporation. Valve and valve sealing member. 4,513,946, Cl. 251-173.000.

Princler, Gerald L.: *See—*
Braatz, James A.; McIntire, Kenneth R.; and Princler, Gerald L., 4,514,506, Cl. 436-518.000.

Pritchard, Frederick D.; and Pittard, John E., to Burlington Industries, Inc. Automated sizing system controlling. 4,514,092, Cl. 366-136.000.

Procom, B.V.: *See—*
Ketels, Gerardus H. J., 4,513,477, Cl. 17-46.000.

Procter & Gamble Company, The: *See—*
Doughty, Elexsis D., 4,513,459, Cl. 4-222.000.
Ives, Donald T.; Madill, Michael J.; and Sliva, Philip G., 4,514,444, Cl. 427-242.000.
Johnson, Bruce A.; and Wnuk, Andrew J., 4,514,345, Cl. 264-22.000.

Proctor, Robert H.; and Hobbs, Arthur G., Jr., to Murray Corporation. Weight-monitored air-conditioner charging station. 4,513,578, Cl. 62-149.000.

Prodel, Jacques: *See—*
Prodel, Maurice; and Prodel, Jacques, 4,513,854, Cl. 198-472.000.

Prodel, Maurice; and Prodel, Jacques. Machines for assembling or for machining parts. 4,513,854, Cl. 198-472.000.

Prodes, S.A.: *See—*
Veit, Dagmar V., 4,514,404, Cl. 514-265.000.

Prodger, Terence E.: *See—*
Billington, Richard W.; Blackwell, Gordon B.; and Prodger, Terence E., 4,514,342, Cl. 260-952.000.

Propane Carburetion Systems, Inc.: *See—*
Lagano, Thomas; and Batchelor, William H., 4,513,727, Cl. 123-525.000.

Protectaire Systems Co.: *See—*
Otocki, Tadeusz S., 4,513,682, Cl. 118-322.000.

Proulx, Richard W.: *See—*
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,514,352, Cl. 264-230.000.

Pruyne, Jerry R., to Miro Industries, Inc. Pipe-supporting device. 4,513,934, Cl. 248-49.000.

Przybyl, Robert V.: *See—*
Bowden, Edgar A.; and Przybyl, Robert V., 4,514,770, Cl. 360-69.000.

Przybylski, Aleksander T.: *See—*
Fox, Sidney W.; and Przybylski, Aleksander T., 4,514,584, Cl. 136-263.000.

Ptaledakis, Nicholas G. Proteolytic enzymes in the zymogen form to treat sarcoma cells. 4,514,388, Cl. 424-94.000.

Pumphrey, Nicholas W. J.: *See—*
Hesketh, Bernard; and Pumphrey, Nicholas W. J., 4,514,274, Cl. 204-290.00F.

Punater, Dinesh G.; and Bastian, Donald G., to Harris Graphics Corporation. Apparatus and method for measuring rotational position. 4,514,819, Cl. 364-556.000.

Purcell, Glenn T., to Masco Corporation of Indiana. Method of manufacturing faucets and spouts, faucet inserts, and faucets and spouts manufactured by the method. 4,513,769, Cl. 137-315.000.

Puskas, Imre, to Standard Oil Company (Indiana). Method for manufacture of AMS-1B crystalline borosilicate molecular sieve with low sodium content. 4,514,516, Cl. 502-202.000.

Puzio, Daniel: *See—*
Farrand, Robert M.; and Puzio, Daniel, 4,513,784, Cl. 137-854.000.

Quantel Limited: *See—*
Walker, Ian C., 4,514,818, Cl. 364-521.000.

Quast, Hein: *See—*
Immel, Otto; Schwarz, Hans-Helmut; Quast, Hein; and Bandtel, Eberhard, 4,514,578, Cl. 568-853.000.

Queen's University at Kingston: *See—*
Wolfe, Saul; and Shaw, Chia-Cheng, 4,514,333, Cl. 260-239.00A.

Quinlan, Patrick M., to Petrolite Corporation. Halide free corrosion inhibitors. 4,514,320, Cl. 252-392.000.

Quinones, Matthew M.: *See—*
Mirow, Fred A.; and Quinones, Matthew M., 4,514,820, Cl. 364-858.000.

Quintec Interconnect Systems: *See—*
Lax, Ronald G.; Johnson, Robert G.; Henningsen, Charles G.; and Ellis, J. Scott, 4,514,029, Cl. 339-143.00R.

R. A. Jones & Co. Inc.: *See*—
Hughes, Charles C., 4,514,181, Cl. 493-131.000.
Raccach, Moshe, to Microlife Technics, Inc. Fermentation composition using a selected lactobacillus. 4,514,424, Cl. 426-56.000.
Raczek, Mieczyslaw J. Valve retainer for automotive valve repair. 4,513,486, Cl. 29-220.000.
Raddant, Hans-Joachim: *See*—
Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joachim, 4,514,670, Cl. 318-467.000.
Raduta, Margaret C.: *See*—
Chestnut, Raymond; Colussi, John J.; Frost, Donald J.; Keen, William E., Jr.; and Raduta, Margaret C., 4,514,307, Cl. 210-751.000.
Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Partitionable pack with end plates. 4,514,778, Cl. 360-133.000.
Rahn, Raymond A. Sweeper blower device. 4,513,471, Cl. 15-340.000.
Raisin, Helmut: *See*—
Schutz, Hans U.; Raisin, Helmut; and Bouwknegt, Thys, 4,514,187, Cl. 8-531.000.
Rajnigl, Zdenek; Mladek, Milos; Blasko, Michal; and Smatana, Josef, to ZVL Vyzkumny ustav pro valiva loziska Brno koncernova ucelova organizace. Resilient support for a high-speed rotor. 4,513,566, Cl. 57-406.000.
Rankin, Jacky P.: *See*—
Rankin, P. Phillip, Sr.; Rankin, R. Dewon; and Rankin, Jacky P., 4,513,452, Cl. 2-81.000.
Rankin, P. Phillip, Sr.; Rankin, R. Dewon; and Rankin, Jacky P. Heat resistant suit for use in boiler repair. 4,513,452, Cl. 2-81.000.
Rankin, R. Dewon: *See*—
Rankin, P. Phillip, Sr.; Rankin, R. Dewon; and Rankin, Jacky P., 4,513,452, Cl. 2-81.000.
Rao, Srinivas T.; and Hawrylo, Frank Z., to RCA Corporation. Bonding pads for semiconductor devices. 4,514,265, Cl. 204-15.000.
Rauch, Hans: *See*—
Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joachim, 4,514,670, Cl. 318-467.000.
Rauch, Kurt: *See*—
Coch, Lester; and Rauch, Kurt, 4,514,093, Cl. 366-138.000.
Rautenberg, Lutz: *See*—
Kaeufer, Helmut; Rautenberg, Lutz; and Pahl, Joachim, 4,514,351, Cl. 264-210.200.
Raychem Corporation: *See*—
Cheng, Tai C.; and McKinley, Bruce A., 4,514,620, Cl. 219-553.000.
Raychem Pontoise, S. A.: *See*—
Lionnet, Richard, 4,514,031, Cl. 339-205.000.
Raydex International Limited: *See*—
McDonald, Neil, 4,514,036, Cl. 350-96.230.
Rayl, Martin: *See*—
Whitley, George J.; and Rayl, Martin, 4,513,493, Cl. 29-566.300.
RCA Corporation: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,514,760, Cl. 358-143.000.
Bloom, Stanley, 4,514,658, Cl. 313-402.000.
Chen, Hsing-Yao, 4,514,659, Cl. 313-412.000.
Deal, Samuel B.; and Cushman, Barry M., 4,514,456, Cl. 428-204.000.
Nowogrodzki, Markus; and Mawhinney, Daniel D., 4,513,748, Cl. 128-653.000.
Opresko, Stephen T., 4,514,660, Cl. 313-446.000.
Rao, Srinivas T.; and Hawrylo, Frank Z., 4,514,265, Cl. 204-15.000.
Rindal, Abraham E., 4,514,763, Cl. 358-167.000.
Stone, Robert P., 4,514,661, Cl. 315-3.000.
Tower, John R., 4,514,821, Cl. 364-862.000.
Verma, Surendra K.; and Kim, George A., 4,514,192, Cl. 51-295.000.
Vieland, Leon J., 4,514,663, Cl. 315-366.000.
Whitley, George J.; and Rayl, Martin, 4,513,493, Cl. 29-566.300.
Young, William C., 4,513,505, Cl. 33-1.0MP.
Re, Eugene L. Denture coupling. 4,514,173, Cl. 433-178.000.
Rebhan, Herbert J., to Domain, Inc. Mold growth inhibitor and method. 4,514,425, Cl. 426-93.000.
Reed, John T., to Singer Company, The. Spherical projection-type screen for use in a vehicle simulator. 4,514,347, Cl. 264-32.000.
Reed Rock Bit Company: *See*—
Daly, Jeffery E., 4,514,097, Cl. 384-93.000.
Reed, Steven P., to Brown & Williamson Tobacco Corporation. Device for making grooves in cigarette filters. 4,514,249, Cl. 156-553.000.
Rees, Richard W. A.: *See*—
Langmesser, Otto J., Jr.; and Rees, Richard W. A., 4,513,937, Cl. 248-394.000.
Reese, Thorsten, to Continental Gummi-Werke Aktiengesellschaft. Inflating gas for tires. 4,513,803, Cl. 152-427.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, to ADIR. Disubstituted polymethylene imines. 4,514,398, Cl. 514-245.000.
Regnier, Gilbert; Dhainaut, Alain; Laubie, Michel; and Duhault, Jacques, to Adir. N-N'substituted polymethylene diamines. 4,514,399, Cl. 514-241.000.
Regogollwitzer GmbH and Co. KG: *See*—
Gollwitzer, Reiner, 4,513,999, Cl. 292-161.000.
Reich, Douglas R. Method and means for preventing frost damage to crops. 4,513,529, Cl. 47-2.000.
Reichhold Chemicals, Inc.: *See*—
Hattrich, George A.; and Byron, Stephen J., 4,514,539, Cl. 524-436.000.
Reid, Donald J., to British Gas Corporation. Apparatus for minimizing the amount of fluid leaked from a component in a hydraulic power system when the system has failed. 4,513,774, Cl. 137-392.000.
Reid, Michael: *See*—
Noto, Peter; and Reid, Michael, 4,514,178, Cl. 434-395.000.
Reik, Wolfgang, to LuK Lamellen und Kupplungsbau GmbH. Friction clutch. 4,513,849, Cl. 192-70.270.
Reinecke, Paul: *See*—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,514,402, Cl. 514-250.000.
Reiss, Linda. Hot/cold food dispensing machine. 4,513,879, Cl. 221-150.0HC.
Reith, Walter: *See*—
Walter, Lothar; and Reith, Walter, 4,514,017, Cl. 308-6.00C.
Remcor Products Company: *See*—
Koeneman, Robert M.; Miller, Benjamin D.; Jablonski, Thaddeus M.; and Schafer, Albert L., 4,513,892, Cl. 222-235.000.
Renaud, Bruce J. Convertible design surface, and method for forming the design. 4,513,991, Cl. 283-1.00R.
Renishaw Electrical Limited: *See*—
McMurtry, David R., 4,513,646, Cl. 82-1.00C.
Renner, Robert E., to GTE Automatic Electric Inc. T-S-T-S-T Digital switching network. 4,514,842, Cl. 370-63.000.
Renzel, Peter; and Kroesen, Klaus, to Krautkramer-Branson, Inc. Ultrasonic test instrument with controllable amplifier. 4,513,621, Cl. 73-631.000.
Republic Geothermal, Inc.: *See*—
Michels, Donald E., 4,513,818, Cl. 166-244.00C.
Republic Steel Corporation: *See*—
Cole, Frank J.; and Hahn, Henry N., 4,514,266, Cl. 204-28.000.
Rescalli, Carlo: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Research Corporation: *See*—
Fraser-Reid, Bertram; and Pauls, Heinz W., 4,514,561, Cl. 536-18.700.
Resz, Raoul; Alberts, Heinrich; Burgdorfer, Hans-Heribert; and El Sayed, Aziz, to Bayer Aktiengesellschaft. Coating powder based on saponified ethylene/vinyl acetate copolymers and the use thereof. 4,514,546, Cl. 525-57.000.
Rettich, Jakob; and Spiewok, Leonhard, to Sulzer-Escher Wyss Ltd. Method for controlling the acceleration of a centrifuging device. 4,513,464, Cl. 8-159.000.
Reuschenbach, Hermann: *See*—
Molders, Werner; Langanke, Rolf; Sentinger, Egon; and Reuschenbach, Hermann, 4,513,953, Cl. 267-121.000.
Reynolds, George A.: *See*—
Scozzafava, Michael; Chen, Chin H.; Reynolds, George A.; and Perlstein, Jerome H., 4,514,481, Cl. 430-58.000.
Rhoads, Roger R., to Owens-Illinois, Inc. Bottle carrier. 4,513,860, Cl. 206-150.000.
Rhodes, Edward: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,514,096, Cl. 374-27.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Jacques, Roland; and Dupin, Thierry, 4,514,511, Cl. 502-8.000.
Rhynard, Donald L., to Mobil Oil Corporation. Surfactant monitor for aviation fuel filter/separators. 4,513,606, Cl. 73-61.00R.
Riccio, Pasquale R.: *See*—
Manning, George H.; and Riccio, Pasquale R., 4,514,775, Cl. 360-96.600.
Rice, Rex, to Burroughs Corporation. Integrated circuit package connector. 4,514,023, Cl. 339-17.0CF.
Richardson-Vicks Inc.: *See*—
Dhabhar, Dadi J.; and Schmidt, Nicholas F., 4,514,528, Cl. 523-120.000.
Richmond, Michael S.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.
Richter, Albert P., Jr.; Campsey, Ronald L.; Paap, Hans J.; and Bussian, Alfred E., to Texaco Inc. Petroleum stream analyzer. 4,514,627, Cl. 250-255.000.
Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr AB. Gas treatment of particulate materials in storage containers. 4,513,515, Cl. 34-33.000.
Richter, Ole J.: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,513,515, Cl. 34-33.000.
Ricketts, Thomas E.; and Shaler, John E., to Occidental Oil Shale, Inc. Method for loading explosive charges into blastholes formed in a subterranean formation. 4,513,665, Cl. 102-312.000.
Ricoh Co., Ltd.: *See*—
Matsuura, Tadashi; and Kadomatsu, Yasuo, 4,514,483, Cl. 430-84.000.
Rieger, Franz: *See*—
Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, 4,514,656, Cl. 313-11.500.
Rieger, Martin M.: *See*—
Yang, Robert; and Rieger, Martin M., 4,514,422, Cl. 426-3.000.
Riemer, Heinz; Weiss, Joern-Volker; and Mutzberg, Friedhelm, to Chemische Werke Huels, AG. Method of obtaining a positive bond between painted articles and concrete. 4,514,467, Cl. 428-413.000.

Rieter Machine Works Limited: *See—*
Binder, Rolf; Hanselmann, Daniel; and Schlepfer, Walter, 4,513,479, Cl. 19-80.00R.
Rigg, Bryan C.: *See—*
Garcia, Carlos N.; Rigg, Bryan C.; and Tanner, Sally A., 4,514,489, Cl. 430-327.000.
Riley, Wayne C.: *See—*
Wicke, Charles A.; and Riley, Wayne C., 4,513,887, Cl. 222-146.500.
Rindal, Abraham E., to RCA Corporation. Sound signal and impulse noise detector for television receivers. 4,514,763, Cl. 358-167.000.
Rindfleisch, Volker: *See—*
Lesche, Wolfgang; and Rindfleisch, Volker, 4,514,798, Cl. 364-188.000.
Ringel, Helmut; Zimmer, Erich; and Abdelmonem, Nabil, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Apparatus for producing ion exchange particles charged with uranyl ions. 4,514,296, Cl. 210-96.100.
Rishovd, Erik; and Sorensen, Sven, to A/S Westad Armaturfabrik. Arrangement on a butterfly valve. 4,513,765, Cl. 137-72.000.
Rivetti, Franco: *See—*
Romano, Ugo; Rivetti, Franco; and Sasselli, Giacomo, 4,514,339, Cl. 260-453.00P.
Robbins & Myers, Inc.: *See—*
Dover, Donald L.; and Leitch, William J., 4,513,994, Cl. 248-544.000.
Robert Bosch GmbH: *See—*
Bottigheimer, Andreas; Einsele, Karl-Heinz; and Henig, Klaus, 4,514,835, Cl. 368-118.000.
Braun, Gunter; Kratt, Alfred; and Schleicher, Rolf, 4,513,711, Cl. 123-339.000.
Braun, Wolfgang; Konrath, Karl; and Schwarz, Manfred, 4,513,715, Cl. 123-383.000.
Buchner, Norbert, 4,513,876, Cl. 220-270.000.
Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, 4,514,656, Cl. 313-11.500.
Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joachim, 4,514,670, Cl. 318-467.000.
Gassler, Hermann; and Kosak, Wolfgang, 4,513,712, Cl. 123-339.000.
Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, 4,513,708, Cl. 123-263.000.
Steprath, Werner; and Weigle, Dieter, 4,513,826, Cl. 172-7.000.
Roberts, Thomas G.: *See—*
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,514,684, Cl. 324-120.000.
Robson, David: *See—*
Falck, John B.; and Robson, David, 4,514,731, Cl. 340-825.080.
Robson, George E.; and Anderson, Paul R. Spring type hand grip exerciser. 4,513,962, Cl. 272-68.000.
Roche, Michel: *See—*
Frehaut, Joel; and Roche, Michel, 4,514,628, Cl. 250-299.000.
Rock, James E. Fire retardant means and method. 4,514,327, Cl. 252-607.000.
Rockefeller University, The: *See—*
Friedheim, Ernst A. H., 4,514,390, Cl. 514-184.000.
Rockwell International Corporation: *See—*
Holmes, Dale A.; and Waite, Thomas R., 4,514,850, Cl. 372-95.000.
Priese, Werner K., 4,513,946, Cl. 251-173.000.
Spurling, Robert A.; Davis, Burton I.; and Taylor, Norman G., 4,513,537, Cl. 51-71.000.
Thompson, William J., 4,514,706, Cl. 331-16.000.
Vescial, Frederick, 4,514,087, Cl. 356-350.000.
Vescial, Frederick, 4,514,832, Cl. 356-350.000.
Rockwell-Rimoldi S.p.A.: *See—*
Brusasca, Gianfranco; and Garzulano, Franco, 4,513,673, Cl. 112-166.000.
Roddie, Alan G.: *See—*
Edwards, Julian G.; and Roddie, Alan G., 4,514,624, Cl. 250-211.00R.
Rodriguez, Cesar: *See—*
Hendrickson, James B.; and Rodriguez, Cesar, 4,514,569, Cl. 546-146.000.
Rodriguez, Philip A. B., to C-I-L Inc. Stabilizing polysaccharide-thickened aqueous medium and stable aqueous gel. 4,514,318, Cl. 252-315.300.
Rogers, E. Mark. Staple remover. 4,513,951, Cl. 254-28.000.
Rogers Foam Corporation: *See—*
Jalbert, Robert A.; Galcenski, Anthony P., Jr.; and Urmson, Charles C., 4,513,518, Cl. 36-44.000.
Rogers, Howard G., to Polaroid Corporation. Variable focus elastomeric lens system. 4,514,048, Cl. 350-423.000.
Rohm and Haas Company: *See—*
Rothman, Alan M., 4,514,504, Cl. 436-85.000.
Rounds, Nicholas A., 4,514,439, Cl. 427-54.100.
Rohr, Wolfgang: *See—*
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,514,572, Cl. 549-246.000.
Rohrbach, Gerd: *See—*
Bader, Edgar; Rohrbach, Gerd; Petersen, Jurgen; and Kittel, Ludwig, 4,514,840, Cl. 370-29.000.
Rohrbacher, Herbert E., to Bergandi Manufacturing Co., Inc. Security wire fabric and apparatus and method for making same. 4,513,793, Cl. 140-92.400.
Rohrback Corporation: *See—*
Finley, Charles M.; and Moore, Clifford G., 4,514,681, Cl. 324-65.0CR.
Roland, James P., to Hewlett-Packard Company. Technique of producing tapered features in integrated circuits. 4,514,252, Cl. 156-643.000.
Roldan, Frank. Method of making compliant pins. 4,513,499, Cl. 29-874.000.
Rollenitz, Leopold: *See—*
Dolenc, Anton; and Rollenitz, Leopold, 4,513,714, Cl. 123-357.000.
Rollwitz, William L.: *See—*
De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., 4,514,691, Cl. 324-301.000.
Rolston, John H.: *See—*
Symons, Edward A.; Rolston, John H.; Clermont, Michel J.; and Paterson, Linda M., 4,514,377, Cl. 423-648.00A.
Romano, Ugo; Rivetti, Franco; and Sasselli, Giacomo, to Enichimica S.p.A. Process for preparing alkyl isocyanates. 4,514,339, Cl. 260-453.00P.
Roncaglione, James W. Vehicle washing apparatus having a yieldable brush shaft coupling. 4,513,467, Cl. 15-53.0AB.
Roof, Glenn L.: *See—*
Wang, Sophia; Roof, Glenn L.; and Porlier, Beth W., 4,514,286, Cl. 208-196.000.
Root, Jon C.; Barnes, John F.; and Coovert, Jack E., to Witco Chemical Corporation. Lubricant compositions comprising a phosphate additive system. 4,514,312, Cl. 252-32.500.
Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Benzofuran and benzothiophene sulfonamides. 4,514,211, Cl. 71-92.000.
Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfamates. 4,514,214, Cl. 71-93.000.
Roschlein, Rolf; and Schulte, Heinz, to Nixdorf Computer AG. Ink jet filtered-chamber print head. 4,514,743, Cl. 346-140.00R.
Rose, Douglas N.; and Becker, John E., to United States of America, Army. Method for making a radial flow ceramic rotor for rotary type regenerator heat exchange apparatus: and attendant ceramic rotor constructions. 4,513,807, Cl. 165-10.000.
Roselt, Udo; Nolte, Lothar; and Pohler, Manfred, to VEB Kombinat Feinmechanische Werke Halle. Method for the production of a transverse corrugated or serrated interior pipe of a double-walled special gas discharge pipe with high angle selectivity. 4,514,206, Cl. 65-108.000.
Rosenbaum, Stanley D.; and Handforth, Martin R., to Northern Telecom Limited. Active impedance line feed circuit. 4,514,595, Cl. 179-16.00F.
Rosenquist, Kenneth G.: *See—*
Parson, Roger F.; Rosenquist, Kenneth G.; and Schmit, Justin M., 4,513,918, Cl. 241-101.400.
Rosenthal, Dan G.; and Fiedler, Louis J., to Avco Corporation. Diffusion bonding between titanium base alloys and steels. 4,514,470, Cl. 428-662.000.
Roser, Carl A.; and Ehrler, Arthur J., to Roser, Carl A. Lawn mower rotary assembly. 4,513,563, Cl. 56-295.000.
Ross, Charles W., to General Signal Corporation. Unit controller for multiple-unit dispatch control. 4,514,642, Cl. 290-40.00R.
Rossi, Albert, to Exxon Research and Engineering Co. Oil soluble ester pour point depressant additive for lubricants. 4,514,314, Cl. 252-56.00D.
Roth, Douglas D.; and Ethridge, Fredrick A., to Celanese Corporation. Method for melt spinning polyester filaments. 4,514,350, Cl. 264-176.00F.
Rothman, Alan M., to Rohm and Haas Company. Monitoring method for polyacrylic acids in aqueous systems. 4,514,504, Cl. 436-85.000.
Rounds, Nicholas A., to Rohm and Haas Company. Dust cover. 4,514,439, Cl. 427-54.100.
Royer, Wayne H., to Santrade Ltd. Oven heating system. 4,514,167, Cl. 432-11.000.
Rubner, Roland: *See—*
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,514,043, Cl. 350-341.000.
Ruggiero, Ralph: *See—*
Long, Wallace H.; and Ruggiero, Ralph, 4,513,859, Cl. 198-842.000.
Ruhrkohle AG: *See—*
Langhoff, Josef; and Seipenbusch, Jurgen, 4,514,191, Cl. 48-77.000.
Rumble Equipment Limited: *See—*
Warner, Michael V., 4,514,616, Cl. 219-136.000.
Rundell, Herbert A.; and Savage, Kerry D., to Texaco Inc. System for providing RF energy into a hydrocarbon stratum. 4,513,815, Cl. 166-57.000.
Ruscheweyh, Hans, to Balcke-Durr Aktiengesellschaft. Apparatus for the mixing of different streams of air in a cooling tower. 4,514,344, Cl. 261-159.000.
Russak, Steffen P., to Sulzer Brothers Limited. Pressure medium actuated servo-motor system. 4,513,943, Cl. 251-31.000.
Russell, Jeffrey A.: *See—*
Clampitt, Richard L.; and Russell, Jeffrey A., 4,514,308, Cl. 252-8.50C.
Russo, Anthony; and Mauthner, Thomas, to J. Hall Company. Aqueous metal treating compositions and method of use. 4,514,325, Cl. 252-557.000.
Rutkowski, Eugene V.: *See—*
Blumenthal, Jack L.; Ogren, John R.; Rutkowski, Eugene V.; and Appel, Marvin, 4,514,698, Cl. 330-4.300.
Ryan, Michael G.: *See—*
Darves-Bornoz, Yves; Melvin, George E.; Ryan, Michael G.; and Saylor, Dennis L., 4,513,613, Cl. 73-159.000.

Ryan, Robert C.; and Slaugh, Lynn H., to Shell Oil Company. Homologous carboxylic acids production. 4,514,336, Cl. 260-413.000.
Ryder, John C.: *See*—
Maier, Otto H.; Seifert, James F.; Ryder, John C.; and Grisez, William F., 4,513,853, Cl. 198-410.000.
Ryobi Ltd.: *See*—
Tsunoda, Kikuo; and Kobayashi, Takehiro, 4,513,926, Cl. 242-84.20G.
S.N.E.C.M.A.: *See*—
Marey, Daniel J., 4,514,141, Cl. 415-160.000.
Saab-Scania Aktiebolag: *See*—
Nordstrom, Lennart, 4,513,509, Cl. 33-330.000.
Sabater Gonzalez, Buenaventura. Arrangement for the distribution of pressurized fluid to a seat unit having a backrest. 4,514,010, Cl. 297-284.000.
Sachenik, Paul A.: *See*—
Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,514,053, Cl. 350-162.200.
Sagady, Daniel V., to Ford Motor Company. Retention ring for splined joint. 4,514,108, Cl. 403-359.000.
Sagues, Alberto A.: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; Davis, Burtron H.; and Schweighardt, Frank K., 4,514,281, Cl. 208-47.000.
Sainen, Tsutomu; Sakano, Toshiyuki; Fujita, Yoshitaka; and Imai, Toshiki, to Tsudakoma Corp. Method and apparatus for controlling motor-driven let-off motion for looms. 4,513,790, Cl. 139-110.000.
Saito, Junichi; and Kagabu, Shinzo, to Nihon Tokushu Noyaku Seizo K.K. 2,2-Dihalogeno-3,3-dimethylcyclopropane derivative fungicides. 4,514,418, Cl. 514-508.000.
Saito, Junichi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; and Shiokawa, Kozo, 4,514,210, Cl. 71-92.000.
Saito, Kimitaka: *See*—
Kohama, Tokio; Obayashi, Hideki; Saito, Kimitaka; Ina, Toshikazu; and Narita, Seiichi, 4,513,627, Cl. 73-862.340.
Obayashi, Hideki; Kohama, Tokio; Saito, Kimitaka; Kawai, Hisasi; and Ina, Toshikazu, 4,513,626, Cl. 73-862.340.
Saito, Susumu: *See*—
Okada, Kunihiro; Endo, Hirohide; Saito, Susumu; and Kataoka, Kenji, 4,514,079, Cl. 355-8.000.
Saito, Toranosuke: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.
Saitoh, Hiroyuki; and Kikuchi, Yoshiki, to Fuji Xerox Co., Ltd. Electrostatic copying device employing thermally fluidizable medium on photosensitive belt. 4,514,744, Cl. 346-153.100.
Saitou, Hiroyuki: *See*—
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Sakai, Kazuo: *See*—
Ikematsu, Masaki; Honzyo, Isao; and Sakai, Kazuo, 4,514,287, Cl. 208-309.000.
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, to Nippon Piston Ring Co., Ltd. Rotary-sleeve bearing apparatus for rotary compressor. 4,514,156, Cl. 418-173.000.
Sakamoto, Takashi: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.
Sakamoto, Toshiharu: *See*—
Fujii, Hiroshi; and Sakamoto, Toshiharu, 4,513,696, Cl. 123-41.020.
Sakamoto, Yukio; and Tanabe, Takeshi, to Murata Manufacturing Co., Ltd. Multiple feedthrough-capacitor unit. 4,514,782, Cl. 361-306.000.
Sakano, Toshiyuki: *See*—
Sainen, Tsutomu; Sakano, Toshiyuki; Fujita, Yoshitaka; and Imai, Toshiki, 4,513,790, Cl. 139-110.000.
Sakaue, Yoshinori: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,514,740, Cl. 346-139.00R.
Sakmann, Walter H.; and Zimmermann, Volker, to International Business Machines Corporation. Method and apparatus for the constant speed control of brushless DC motors. 4,514,667, Cl. 318-254.000.
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, to Toyota Jidosha Kabushiki Kaisha. Oxygen sensor element. 4,514,277, Cl. 204-424.000.
Sakurai, Yojiro: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.
Sallay, Stephen I. Permanent flame retardant and anti-smoldering compositions. 4,514,326, Cl. 252-602.000.
Salloway, Anthony J.: *See*—
Garner, Geoffrey M.; and Salloway, Anthony J., 4,514,596, Cl. 179-84.00T.
Samsel, J. Edward, Jr., to American Gaming Industries, Inc. Automatic card shuffler. 4,513,969, Cl. 273-149.00R.
Sanchez, Francis F. Auxiliary vehicle space heater. 4,513,911, Cl. 237-12.30C.
Sanden Corporation: *See*—
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, 4,514,150, Cl. 417-440.000.
Sanderson, Michael L.: *See*—
McHale, Edward J.; Hussain, Yousif A.; Sanderson, Michael L.; and Hemp, John, 4,513,624, Cl. 73-861.120.
Sanko Kaihatsu Kagaku Kenkyusho Corporation: *See*—
Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, 4,514,745, Cl. 346-216.000.
Sano, Konosuke: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, to Toa Grout Kogyo Co., Ltd.; Mitsui Toatsu Chemicals, Inc.; and Tonan Kaihatsu/Kogyo Co., Ltd. Method for injecting grouting agent and apparatus for conducting the method. 4,514,112, Cl. 405-269.000.
Sanofi: *See*—
Nisato, Dino; and Boveri, Sergio, 4,514,408, Cl. 514-212.000.
Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, 4,514,397, Cl. 514-247.000.
Santa Barbara Research Center: *See*—
Davis, Roland O., 4,514,016, Cl. 308-2.00A.
Santo Industries Co., Ltd.: *See*—
Watabe, Takaharu, 4,513,474, Cl. 16-243.000.
Santo, Philip J. Floatation sleep system. 4,513,463, Cl. 5-452.000.
Santrade Ltd.: *See*—
Kaminsky, Theo, 4,514,116, Cl. 408-161.000.
Royer, Wayne H., 4,514,167, Cl. 432-11.000.
Sanyo Electric Co., Ltd.: *See*—
Toya, Syouichi, 4,513,470, Cl. 15-328.000.
Sarver, Glen E.; and Worstell, Bernard W., to B. F. Goodrich Company, The. Solar actuated drain system. 4,513,768, Cl. 137-142.000.
Sasaki, Makoto, to Minnesota Mining and Manufacturing Company. Low-profile transfer article. 4,514,457, Cl. 428-204.000.
Sasaki, Masafumi; Kashiwagi, Susumu; and Hiyoshi, Takanori, to Nissan Motor Company, Limited. Combustion liner support for combustion apparatus. 4,513,569, Cl. 60-39.310.
Sasaki, Toshio: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
SASIB S.p.A.: *See*—
Baroni, Bruno, 4,513,755, Cl. 131-84.00C.
Manservisi, Renato; and Fossi, Mario, 4,513,908, Cl. 229-87.00C.
Sasselli, Giacomo: *See*—
Romano, Ugo; Rivetti, Franco; and Sasselli, Giacomo, 4,514,339, Cl. 260-453.00P.
Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,513,867, Cl. 209-44.200.
Satake, Toshihiko, to Satake Engineering Co., Ltd. Sorter for grains, pulses and the like. 4,513,867, Cl. 209-44.200.
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, to Chisso Corporation. Preactivated catalyst for producing α-olefin polymers. 4,514,513, Cl. 502-112.000.
Sato, Atsushi; Murai, Yoshikazu; Goto, Masahito; and Mochizuki, Kanji, to Nippon Petrochemicals Company, Limited. Paper sizing composition. 4,514,229, Cl. 106-135.000.
Sato, Giichi; Matuo, Tadashi; and Tabei, Tooru, to Nippon Kayaku Kabushiki Kaisha. Water soluble disazo compound, copper salt thereof, and sheet or film colored therewith. 4,514,559, Cl. 534-690.000.
Sato, Jun, to Shimano Industrial Company Limited. Fishing reel. 4,513,930, Cl. 242-218.000.
Sato, Kanemasa; and Ueno, Sadayasu, to Hitachi, Ltd. Thermal air flow meter. 4,513,615, Cl. 73-204.000.
Sato, Kozo: *See*—
Hirai, Hiroyuki; Sato, Kozo; and Kawata, Ken, 4,514,493, Cl. 430-617.000.
Sato, Masahiro: *See*—
Takenaka, Akihiko; Arakawa, Miyao; Sato, Masahiro; and Yamaguchi, Toshiyuki, 4,513,609, Cl. 73-116.000.
Sato, Nobuhiro: *See*—
Abe, Hiroshi; Sato, Nobuhiro; Ono, Kimizo; and Hirano, Kazuo, 4,513,751, Cl. 128-666.000.
Sato, Yoshinori: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,514,423, Cl. 426-3.000.
Saud, Ivan: *See*—
Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, 4,513,735, Cl. 128-24.200.
Saukkonen, Esko: *See*—
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa, Immo, 4,514,816, Cl. 364-478.000.
Saulters, John D.; and Scarr, Roger H., to Joy Manufacturing Company. Method and apparatus for controlling the position of a hydraulic boom. 4,514,796, Cl. 364-142.000.
Saunders, Stephen W.: *See*—
Kremer, Ross A.; and Saunders, Stephen W., 4,514,288, Cl. 209-5.000.
Savage, Kerry D.: *See*—
Rundell, Herbert A.; and Savage, Kerry D., 4,513,815, Cl. 166-57.000.
Sawa, Natsuo; Suzuki, Toshihiro; and Okazaki, Shinji, to Shikoku Chemicals Corporation. 4,4'-Methylene-bis-(2-ethyl-5-methyl imidazole) and methods of producing and using the same. 4,514,556, Cl. 528-117.000.

Sawada, Daisaku: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.

Sawada, Minoru: *See*—
Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, 4,513,753, Cl. 128-706.000.

Sayles, David C., to United States of America, Army. Microwave drying of ammonium perchlorate grinding spheres. 4,513,513, Cl. 34-1.000.

Saylor, Dennis L.: *See*—
Darves-Bornoz, Yves; Melvin, George E.; Ryan, Michael G.; and Saylor, Dennis L., 4,513,613, Cl. 73-159.000.

Scale Free Systems, Inc.: *See*—
Vollman, Leonard L., 4,514,273, Cl. 204-196.000.

Scantron GmbH & Co.: *See*—
Wevelsiep, Klaus; and Kastner, Anton, 4,514,622, Cl. 235-463.000.

Scarr, Roger H.: *See*—
Saulters, John D.; and Scarr, Roger H., 4,514,796, Cl. 364-142.000.

Schaefer, William J., Jr., to NCR Corporation. Item dispensing system. 4,513,957, Cl. 271-90.000.

Schafer, Albert L.: *See*—
Koeneman, Robert M.; Miller, Benjamin D.; Jablonski, Thaddeus M.; and Schafer, Albert L., 4,513,892, Cl. 222-235.000.

Schalkowsky, Ellen R.: *See*—
Schalkowsky, Samuel; and Schalkowsky, Ellen R., 4,514,495, Cl. 435-32.000.

Schalkowsky, Samuel; and Schalkowsky, Ellen R., to Spiral Systems Instruments, Inc. Method for testing microbial interaction with growth affecting substances. 4,514,495, Cl. 435-32.000.

Schambeck, Herbert, to Dyckerhoff & Widmann Aktiengesellschaft. Stiffening girder for a stayed cable bridge. 4,513,465, Cl. 14-17.000.

Scharf, Karl-Gunter: *See*—
Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, 4,514,449, Cl. 428-76.000.

Schefers, Friedhelm: *See*—
Lodwig, Klaus; and Schefers, Friedhelm, 4,514,011, Cl. 299-42.000.

Scheinpflug, Hans: *See*—
Brandes, Wilhelm; Kaspers, Helmut; Reinecke, Paul; Scheinpflug, Hans; and Kramer, Wolfgang, 4,514,402, Cl. 514-250.000.

Schenck, Stephen R.: *See*—
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,514,828, Cl. 365-8.000.

Scherenberg, Dieter: *See*—
Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, 4,513,708, Cl. 123-263.000.

Schering Aktiengesellschaft. *See*—
Landsiedel, Horst; and Plum, Hans, 4,514,225, Cl. 106-15.050.

Scherling, Sandra L.: *See*—
Jordan, J. Kirk; and Scherling, Sandra L., 4,514,426, Cl. 426-113.000.

Schierjott, Rudolf, to Siemens Aktiengesellschaft. Secondary switch controller circuit for power supply. 4,514,679, Cl. 323-222.000.

Schillinger, Joseph F., to Champion International Corporation. Flip top dispenser carton. 4,513,863, Cl. 206-264.000.

Schirk, Gunter: *See*—
Koninger, Horst; Lehnert, Klaus; and Schirk, Gunter, 4,514,071, Cl. 354-320.000.

Schleicher, Rolf: *See*—
Braun, Gunter; Kratt, Alfred; and Schleicher, Rolf, 4,513,711, Cl. 123-339.000.

Schleimer, Stephen I.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Schlembach, Hans: *See*—
Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, 4,513,708, Cl. 123-263.000.

Schlepfer, Walter: *See*—
Binder, Rolf; Hanselmann, Daniel; and Schlepfer, Walter, 4,513,479, Cl. 19-80.00R.

Schleppnik, Alfred A.: *See*—
Tou, Jacob S.; and Schleppnik, Alfred A., 4,514,340, Cl. 260-465.00D.

Schlesinger, Sheldon I.; Cerenzia, Walter S.; and Wilson, Thomas D., to James River-Norwalk, Inc. Manufacture of molded paperboard articles. 4,514,354, Cl. 264-324.000.

Schmidt, Fred W.: *See*—
Baus, Rene; and Schmidt, Fred W., 4,514,623, Cl. 235-482.000.

Schmidt, Nicholas F.: *See*—
Dhabhar, Dadi J.; and Schmidt, Nicholas F., 4,514,528, Cl. 523-120.000.

Schmidtlein, Hubertus; and Lerche, Horst-Dieter, to Vereinigte Flugtechnische Werke. Control system for aircraft. 4,514,733, Cl. 343-5.0MM.

Schmit, Justin M.: *See*—
Parson, Roger F.; Rosenquist, Kenneth G.; and Schmit, Justin M., 4,513,918, Cl. 241-101.400.

Schnapper, Martin: *See*—
Sternberg, Rudolf; and Schnapper, Martin, 4,513,701, Cl. 123-188.0AA.

Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Ink fountain dividing key. 4,513,662, Cl. 101-207.000.

Schneider, Lutz; and Guigas, Bruno, to Bruker Analytische Messtechnik GmbH. Device for data acquisition. 4,514,822, Cl. 364-900.000.

Schneider, Steven L.; and Dravnieks, Konstantins, to Wehr Corporation. Energy recovery ventilator. 4,513,809, Cl. 165-54.000.

Schoenberg, Allan R.: *See*—
LeStrange, Raymond J.; Bayless, John H., Jr.; and Schoenberg, Allan R., 4,514,492, Cl. 430-600.000.

Schoenberg, Julian H., to W. R. Grace & Co., Cryovac Div. Storm window film comprising at least five layers. 4,514,465, Cl. 428-339.000.

Scholl, Hans, to Koch Adler AG. Method and device for safe operation of an automatic sewing machine. 4,513,677, Cl. 112-262.300.

Schulte, Heinz: *See*—
Roschlein, Rolf; and Schulte, Heinz, 4,514,743, Cl. 346-140.00R.

Schulte & Lestraden B.V.: *See*—
Lestraden, Jacobus W., 4,513,531, Cl. 47-39.000.

Schulz, Eckhard, to Sicowa Verfahrenstechnik fur Baustoffee GmbH & Co. KG. Appliance for heating an electroconductive material in the form of a continuous strand. 4,514,162, Cl. 425-174.80R.

Schumaker, Jon S., to Pandrol Ltd. Holding a railway rail down on a support member. 4,513,912, Cl. 238-349.000.

Schussler, Rainer: *See*—
Damson, Eckart; Latsch, Reinhard; Linder, Ernst; Rieger, Franz; and Schussler, Rainer, 4,514,656, Cl. 313-11.500.

Schutz, Hans U.; Raisin, Helmut; and Bouwknegt, Thys, to Ciba-Geigy Corporation. Process for dyeing differential-dyeing polyamide fibres. 4,514,187, Cl. 8-531.000.

Schwarz, Hans-Helmut: *See*—
Immel, Otto; Schwarz, Hans-Helmut; Quast, Hein; and Bandtel, Eberhard, 4,514,578, Cl. 568-853.000.

Schwarz, Manfred: *See*—
Braun, Wolfgang; Konrath, Karl; and Schwarz, Manfred, 4,513,715, Cl. 123-383.000.

Schweighardt, Frank K.: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; Davis, Burtron H.; and Schweighardt, Frank K., 4,514,281, Cl. 208-47.000.

Schwenk, Wilhelm: *See*—
Niehaus, Norbert; Friehe, Werner; and Schwenk, Wilhelm, 4,513,995, Cl. 285-55.000.

Scott & Fetzer Company, The: *See*—
Ford, Roger S.; Shie, Herman J., III; and Baird, Thomas E., Sr., 4,514,199, Cl. 55-337.000.

Scott, Larry. Quick-change tool holder and tool. 4,514,117, Cl. 408-239.00R.

Scowen, Reginald V.: *See*—
Lee, Robert S.; and Scowen, Reginald V., 4,514,185, Cl. 8-137.000.

Scozzafava, Michael; Chen, Chin H.; Reynolds, George A.; and Perlstein, Jerome H., to Eastman Kodak Company. 4H-Thiopyran-1,1-dioxide and electrophotographic layers and elements comprising same. 4,514,481, Cl. 430-58.000.

Scrlac, Walter: *See*—
Witte, Klaus J.; Fill, Ernst; and Scrlac, Walter, 4,514,848, Cl. 372-25.000.

Se, Kazunori: *See*—
Miyaki, Yoshiyuki; Fujita, Yoshitaka; Se, Kazunori; and Fujimoto, Teruo, 4,514,304, Cl. 210-638.000.

Seaborne, Thomas L. Vacuum pulsator valves. 4,513,766, Cl. 137-103.000.

Sebastiano, Francesco: *See*—
Pinelli, Tazio; and Sebastiano, Francesco, 4,514,040, Cl. 350-286.000.

Secher, David S. Assay for interferon. 4,514,507, Cl. 436-518.000.

Secom Co., Ltd.: *See*—
Shiraiwa, Toshiyuki; and Ooba, Kaoru, 4,514,721, Cl. 340-527.000.

Seehawer, Magda. Yarn. 4,513,564, Cl. 57-206.000.

Segletes, Steven B., to United States of America, Army. Confinement fabrication technique for asymmetrically confined shaped-charge warheads. 4,513,666, Cl. 102-476.000.

Segutronica, S.A.: *See*—
Garcia, Antonio D., 4,514,001, Cl. 292-341.160.

Seidel, Roland H., to AT&T Technologies, Inc. Connectorized cable and methods of making. 4,514,027, Cl. 339-105.000.

Seifert, James F.: *See*—
Maier, Otto H.; Seifert, James F.; Ryder, John C.; and Grisez, William F., 4,513,853, Cl. 198-410.000.

Seiki, Kazuo: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; Seiki, Kazuo; and Takasu, Shigeru, 4,513,481, Cl. 19-244.000.

Seiko Instruments & Electronics Ltd.: *See*—
Suzuki, Hayao, 4,514,666, Cl. 318-293.000.

Seimi Chemical Co., Ltd.: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.

Seipenbusch, Jurgen: *See*—
Langhoff, Josef; and Seipenbusch, Jurgen, 4,514,191, Cl. 48-77.000.

Seitchik, Jerold A.: *See*—
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,514,828, Cl. 365-8.000.

Sekida, Minoru: *See*—
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, 4,514,073, Cl. 354-414.000.

Sekiguchi, Hiroshi: *See*—
Matumoto, Hiroaki; and Sekiguchi, Hiroshi, 4,514,675, Cl. 318-696.000.

Selenke, William M. Label with particular application to laboratory specimen container identification. 4,513,522, Cl. 40-2.00R.

Sellstrom, Kathy B.; and Speranza, George P., to Texaco Inc. Modified amine curing agents and epoxy resins cured therewith. 4,514,530, Cl. 523-456.000.

Sem-Sandberg, Sverre G., to Telefonaktiebolaget LM Ericsson. Connecting unit for a ring bus. 4,514,841, Cl. 370-55.000.

Sendzimir, Tadeusz. Intermediate accumulating system in processing strip material. 4,513,490, Cl. 29-527.600.

Senga, Akihisa; Hidaka, Yoshiaki; and Tsuchiyama, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold structure for internal combustion engines. 4,513,698, Cl. 123-52.0MV.

Sengupta, Sisir K., to Boston University, Trustees of. Carbon-7-substituted atinomycin D analogue. 4,514,330, Cl. 260-112.50R.

Sentinger, Egon: *See*—
Molders, Werner; Langanke, Rolf; Sentinger, Egon; and Reuschenbach, Hermann, 4,513,953, Cl. 267-121.000.

Setescak, Linda L.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,514,411, Cl. 514-215.000.

Sethi, Dalbir S., to FMC Corporation. Pregeneration of tetrahydroanthraquinones in a make-up solution to be added to a hydrogen peroxide working solution. 4,514,376, Cl. 423-588.000.

Seto, Nobuo; Kamio, Takayoshi; and Aoki, Kozo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,514,490, Cl. 430-505.000.

Setra Systems, Inc.: *See*—
Lee, Shih-Ying; and Briefer, Dennis K., 4,513,831, Cl. 177-189.000.

Sexton Can Company, Inc.: *See*—
Mulawski, Walter J., 4,513,874, Cl. 220-89.00A.

Seydel, Scott O.: *See*—
Cutts, William H.; and Seydel, Scott O., 4,513,485, Cl. 28-181.000.

Seyfried, Donald N.: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,513,600, Cl. 72-345.000.

Seymour, Charles M. Retracting refuse can support. 4,513,938, Cl. 248-507.000.

Sfarti, Adrian, to Advanced Micro Devices, Inc. Stepper motor controller. 4,514,673, Cl. 318-685.000.

Shadbolt, Colin F.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.

Shaefer, Robert R.; and Matthews, Kenneth J., to Nibco Inc. Plastic pipe elements and methods for making same. 4,514,244, Cl. 156-158.000.

Shaklee, Kerry L.: *See*—
Whetstone, Albert L.; Shaklee, Kerry L.; and Modjallal, Khosrow, 4,514,726, Cl. 340-710.000.

Shalek, Walter F., to Halliburton Company. Multiple flow rate formation testing device and method. 4,513,612, Cl. 73-155.000.

Shaler, John E.: *See*—
Ricketts, Thomas E.; and Shaler, John E., 4,513,665, Cl. 102-312.000.

Shannon, Michael A.; and Howat, Robert J., to Northern Telecom Limited. Method for production of dielectric insulation layers upon electrical conductors. 4,514,435, Cl. 427-8.000.

Sharon, Arie: *See*—
Melzi, Edward R.; and Sharon, Arie, 4,513,865, Cl. 206-508.000.
Melzi, Edward R.; and Sharon, Arie, 4,513,883, Cl. 222-83.000.

Sharp, James B.: *See*—
Lowrance, Thomas F.; and Sharp, James B., 4,513,856, Cl. 198-695.000.

Sharp Kabushiki Kaisha: *See*—
Minezaki, Shigehiro, 4,514,253, Cl. 156-659.100.
Nukii, Takashi; Nakabu, Shigeo; Iwasaki, Masaru; and Awane, Katunobu, 4,514,042, Cl. 350-331.00R.
Tanaka, Hiroaki, 4,514,041, Cl. 350-337.000.

Sharp, Leo A., Jr.: *See*—
Mendelson, Richard N.; O'Neal, Douglas M.; and Sharp, Leo A., Jr., 4,514,823, Cl. 364-900.000.

Shaver, Donald L.: *See*—
Muirhead, Robert C., Jr.; and Shaver, Donald L., 4,513,532, Cl. 47-58.000.

Shaw, Chia-Cheng: *See*—
Wolfe, Saul; and Shaw, Chia-Cheng, 4,514,333, Cl. 260-239.00A.

Shaw, David H.; and Hall, Ralph R., to Exxon Research and Engineering Co. Dewaxing waxy oil by dilution chilling employing static mixing means. 4,514,280, Cl. 208-33.000.

Shaw, Richard J.: *See*—
Keddie, David P.; and Shaw, Richard J., 4,513,466, Cl. 15-29.000.

Shay, Gregory D.; Eldridge, Emmojean; and Kail, James E., to DeSoto, Inc. Alkali soluble latex thickeners. 4,514,552, Cl. 526-301.000.

Sheldon, Daniel F. Controlled vehicle damping. 4,513,833, Cl. 180-9.100.

Shell Oil Company: *See*—
Closmann, Philip J.; Waxman, Monroe H.; and Deeds, Charles T., 4,514,283, Cl. 208-86.000.
Noordam, Arend, 4,514,547, Cl. 525-510.000.
Ryan, Robert C.; and Slaugh, Lynn H., 4,514,336, Cl. 260-413.000.

Shelton, Edward B.: *See*—
Jennings, William B.; Shelton, Edward B.; and Hayes, Richmond S., Jr., 4,513,586, Cl. 62-263.000.

Sheppard, Ian J.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.

Sheppard, Peter H. Power steering gear with balanced valve. 4,513,654, Cl. 91-378.000.

Sheps, Martin I.: *See*—
Castner, John F., Sr.; and Sheps, Martin I., 4,513,642, Cl. 81-53.00R.

Sherer, William P.: *See*—
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,514,684, Cl. 324-120.000.

Shibata, Akira, to Chugai Denki Kogyo K.K. Internally oxidized Ag-Sn-Bi alloy electrical contact materials. 4,514,238, Cl. 148-431.000.

Shibata, Masaki: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,514,423, Cl. 426-3.000.

Shibata, Takanori: *See*—
Endo, Akira; Hasegawa, Akira; and Shibata, Takanori, 4,514,645, Cl. 307-10.00R.

Shibayama, Shigeki: *See*—
Iwata, Kazuhide; Shibayama, Shigeki; Hidai, Yutaka; and Oyanagi, Shigeru, 4,514,826, Cl. 364-900.000.

Shibazaki, Takeyoshi: *See*—
Kawakita, Shizuo; Shibazaki, Takeyoshi; and Mochida, Hiromi, 4,514,223, Cl. 75-77.000.

Shie, Herman J., III: *See*—
Ford, Roger S.; Shie, Herman J., III; and Baird, Thomas E., Sr., 4,514,199, Cl. 55-337.000.

Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, to Sumitomo Chemical Company, Limited. Method for the production of solid titanium trichloride catalyst. 4,514,512, Cl. 502-107.000.

Shigematsu, Takashi: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.

Shiiki, Zenya; Iizuka, Yo; and Kawakami, Yukichika, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing aromatic sulfide polymer with anhydrous amorphous vitreous complex dehalogenation agent. 4,514,558, Cl. 528-388.000.

Shikoku Chemicals Corporation: *See*—
Sawa, Natsuo; Suzuki, Toshihiro; and Okazaki, Shinji, 4,514,556, Cl. 528-117.000.

Shima, Katsuhiko: *See*—
Yamahira, Yoshiya; Shima, Katsuhiko; Matsusaka, Chikako; and Noguchi, Tetsuo, 4,514,386, Cl. 424-81.000.

Shimada, Hisashi; Arai, Tohru; and Endo, Junji, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Apparatus for physical vapor deposition. 4,514,275, Cl. 204-298.000.

Shimano Industrial Company Limited: *See*—
Sato, Jun, 4,513,930, Cl. 242-218.000.

Shimizu, Kazuyuki: *See*—
Tateishi, Terutaka; and Shimizu, Kazuyuki, 4,514,847, Cl. 371-51.000.

Shimoji, Koji; Hangeisi, Suekiti; and Itou, Keiji, to Toyota Jidosha Kabushiki Kaisha. Muffler for internal combustion engines. 4,513,841, Cl. 181-252.000.

Shinohara, Koichi: *See*—
Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, 4,514,451, Cl. 428-141.000.

Shinohara, Satoru; Fujii, Noboru; Imada, Kiyohisa; Kadota, Genichi; and Ueno, Hideo. Aggregating polysaccharide derived from aureobacidium. 4,514,560, Cl. 536-1.100.

Shinsei Kogyo Co., Ltd.: *See*—
Kobayashi, Masao, 4,514,477, Cl. 429-98.000.

Shiokawa, Kozo: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; and Shiokawa, Kozo, 4,514,210, Cl. 71-92.000.

Shiraiwa, Toshiyuki; and Ooba, Kaoru, to Secom Co., Ltd. Multi-operation mode type of security-ensuring apparatus. 4,514,721, Cl. 340-527.000.

Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi, Kouichi, to Konishiroku Photo Industry Co., Ltd. Method for the formation of images. 4,514,486, Cl. 430-124.000.

Shiseido Co., Ltd.: *See*—
Taguchi, Toshio; Akino, Hisashi; and Nozawa, Takamitsu, 4,513,877, Cl. 220-335.000.

Shoji, Masakazu, to AT&T Bell Laboratories. Chipset synchronization arrangement. 4,514,647, Cl. 307-269.000.

Shoji, Masakazu, to AT&T Bell Laboratories. VLSI Chip with ground shielding. 4,514,749, Cl. 357-68.000.

Shoji, Takeshi: *See*—
Takahashi, Yoshio; and Shoji, Takeshi, 4,514,544, Cl. 525-327.400.

Showa Seiki Kabushiki Kaisha: *See*—
Akashi, Yukimasa, 4,514,115, Cl. 408-139.000.

Shu, Winston R., to Mobil Oil Corporation. Lowering CO_2 MMP and recovering oil using carbon dioxide. 4,513,821, Cl. 166-273.000.

Shu, Winston R.: *See*—
Islip, Philip N.; and Shu, Winston R., 4,513,819, Cl. 166-263.000.

Shue, Robert S.: *See*—
Beever, William H.; Shue, Robert S.; and Childers, Clifford W., 4,514,588, Cl. 174-52.0PE.

Shure Brothers, Inc.: *See*—
Kogen, James; and Anderson, C. Roger, 4,514,836, Cl. 369-74.000.
Plice, Gerald W., 4,514,598, Cl. 179-146.00R.

Shvakhman, Lidia; Agro, Ignatius T.; and Chiusolo, Louis L. Composition. 4,514,538, Cl. 524-315.000.
Sibbald, Alastair: *See*—
Covington, Arthur K.; and Sibbald, Alastair, 4,514,276, Cl. 204-415.000.
Sibley, Richard D.: *See*—
Keller, William F.; and Sibley, Richard D., 4,513,629, Cl. 74-2.000.
Sicowa Verfahrenstechnik fur Baustoffee GmbH & Co. KG: *See*—
Schulz, Eckhard, 4,514,162, Cl. 425-174.80R.
Siegwart, Emil. Shutter for ventilation systems. 4,513,534, Cl. 49-91.000.
Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,514,043, Cl. 350-341.000.
Amtmann, Heribert, 4,514,759, Cl. 358-111.000.
Behringer, Wolfgang, 4,514,172, Cl. 433-126.000.
Bruch, Helmut, 4,514,034, Cl. 350-96.200.
Feuerbaum, Hans-Peter, 4,514,682, Cl. 324-71.300.
Hanni, Manfred; and Brusch, Josef, 4,514,852, Cl. 375-1.000.
Holzermer, Gunter, 4,514,859, Cl. 378-152.000.
Lesche, Wolfgang; and Rindfleisch, Volker, 4,514,798, Cl. 364-188.000.
Lischke, Burkhard; Frosien, Juergen; Anger, Klaus; and Plies, Erich, 4,514,638, Cl. 250-492.200.
Oberstein, Karla; and Thilo, Peer, 4,514,720, Cl. 340-511.000.
Olsen, Willi; Padderatz, Heinz; Palm, Joachim; and Pircher, Christian, 4,514,783, Cl. 361-336.000.
Schierjott, Rudolf, 4,514,679, Cl. 323-222.000.
Steinmann, Peter; and Sutor, Norbert, 4,514,035, Cl. 350-96.230.
Siemens Medical Laboratories, Inc.: *See*—
Chamberlain, Jerry E., 4,514,633, Cl. 250-374.000.
Sievers, Robert E.; and Gillis, John N., to University Patents, Inc. Oxygen sorbent. 4,514,522, Cl. 521-53.000.
Signode Paper Products Company: *See*—
Liebel, Henry L., 4,513,864, Cl. 206-396.000.
Sigvardt, Niels H.; and Baranski, Jan A., to Oce-Helioprint AS. Conveying device for sheets. 4,513,956, Cl. 271-9.000.
Silverman, Martin L., to Warner & Swasey Company, The. Machine tool with chucking controls. 4,513,979, Cl. 279-4.000.
Simoneau, Raynald; Pelletier, Jean-Marc; Di Vincenzo, Antonio; and Boillot, Jean-Paul, to Hydro-Quebec. Protection circuit against electric shocks during welding. 4,514,615, Cl. 219-132.000.
Sims, Dewey M., Jr., to Northern Telecom Limited. Method and an apparatus for extracting tape from a tape cartridge of the internal belt-drive type. 4,514,774, Cl. 360-95.000.
Sinclair, Iain. Electronic completing the square game. 4,513,973, Cl. 273-237.000.
Singer Company, The: *See*—
Reed, John T., 4,514,347, Cl. 264-32.000.
Sumerau, William R.; and Laing, Gordon E., 4,514,200, Cl. 55-368.000.
Singleton, James O.: *See*—
Frye, Samuel M.; and Singleton, James O., 4,514,134, Cl. 414-659.000.
Sinha, Betty B. Rigid multi-cone kite. 4,513,932, Cl. 244-153.00R.
Sinka, Joseph V.: *See*—
Papalos, John G.; and Sinka, Joseph V., 4,514,189, Cl. 44-51.000.
Siuta, Vincent P., to Du Pont de Nemours, E. I., and Company. Thick film conductor compositions. 4,514,321, Cl. 252-512.000.
Sivilotti, Olivo G., to Alcan International Limited. Metal production by electrolysis of a molten electrolyte. 4,514,269, Cl. 204-69.000.
Skeist, S. Merrill; and Gross, Leo. Magnetic arc spreading fluorescent lamps. 4,514,662, Cl. 315-57.000.
SKF Kugellagerfabriken GmbH: *See*—
Walter, Lothar; and Reith, Walter, 4,514,017, Cl. 308-6.00C.
Skinner, Robert T. J., to Lucas Industries. Fuel injection nozzle. 4,513,916, Cl. 239-453.000.
Skogward, Kenneth O. E., to Husqvarna Aktiebolag. Cloth feeder. 4,513,678, Cl. 112-323.000.
Skura, William A., to Uniroyal, Inc. Power transmission belt with fabric cover. 4,514,179, Cl. 474-204.000.
Slager, Mark T. Table upright connector member and process for making the same. 4,514,106, Cl. 403-190.000.
Slater Electric, Inc.: *See*—
Gallas, Gunter A., 4,513,492, Cl. 29-564.700.
Slaugh, Lynn H.: *See*—
Ryan, Robert C.; and Slaugh, Lynn H., 4,514,336, Cl. 260-413.000.
Slinn, David S. L.: *See*—
Lloyd, Harold; and Slinn, David S. L., 4,514,607, Cl. 200-150.00A.
Sliva, Philip G.: *See*—
Ives, Donald T.; Madill, Michael J.; and Sliva, Philip G., 4,514,444, Cl. 427-242.000.
Smatana, Josef: *See*—
Rajsigl, Zdenek; Mladek, Milos; Blasko, Michal; and Smatana, Josef, 4,513,566, Cl. 57-406.000.
Smey, Samuel L.: *See*—
Ameen, Joseph G.; Hogrogian, Richard H.; and Smey, Samuel L., 4,514,232, Cl. 134-1.000.
Smith, C. Byron: *See*—
Mitchell, Donald H.; Pearce, Richard M.; Smith, C. Byron; and Brown, Sand T., 4,514,427, Cl. 426-271.000.
Smith, Daniel J., to Ethicon, Inc. Hard tissue surgical needle. 4,513,747, Cl. 128-339.000.
Smith, David H., to Binks Manufacturing Company. Reversible airless spray nozzle. 4,513,913, Cl. 239-119.000.
Smith, David W., to National Distillers and Chemical Corporation. Manufacture of oxygenated compounds. 4,514,521, Cl. 518-700.000.
Smith, Henry E., to Xerox Corporation. Paper thickness adjusting mechanism for impact printer. 4,514,101, Cl. 400-59.000.
Smith International, Inc.: *See*—
Coates, J. Randall, 4,513,829, Cl. 175-339.000.
Smith, Kenneth C. A.; and Erasmus, Stephen J., to National Research Development Corporation. Scanning transmission electron microscopes. 4,514,629, Cl. 250-311.000.
Smith Kline & French Laboratories Limited: *See*—
Coates, William J., 4,514,568, Cl. 544-408.000.
Smith, Richard W.: *See*—
Woelfel, James A.; and Smith, Richard W., 4,514,013, Cl. 301-63.0PW.
Smith, Roy L.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.
Smithkline Beckman Corporation: *See*—
Bondinell, William E.; Lafferty, John J.; and Zirkle, Charles L., 4,514,414, Cl. 514-422.000.
Chambers, Pamela A.; and Weinstock, Joseph, 4,514,394, Cl. 514-213.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Bohnenkamp, Heinrich, 4,513,491, Cl. 29-527.700.
Snamprogetti, S.p.A.: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Snappe, Roger: *See*—
Travers, Christine; Chan, Trinh D.; Snappe, Roger; and Bournonville, Jean-Paul, 4,514,515, Cl. 502-154.000.
Snitkin, Sidney R.: *See*—
Ginzburg, Vladimir B.; and Snitkin, Sidney R., 4,513,594, Cl. 72-8.000.
Societa' Italiana Vetro-Siv-S.p.A.: *See*—
Pinelli, Tazio; and Sebastiano, Francesco, 4,514,040, Cl. 350-286.000.
Societe Anonyme Dite: SAFT: *See*—
Atkin, John; and Loustau, Marie-Therese, 4,514,473, Cl. 429-10.000.
Societe Chimique des Carbonnages S.A.: *See*—
Mehalla, Hacene, 4,514,542, Cl. 525-193.000.
Societe Civile Styled: BMB: *See*—
Moiroux, Auguste, 4,513,697, Cl. 123-41.350.
Societe d'Etudes de Machines Thermiques, S.E.M.T.: *See*—
Bonnaud, Pierre L., 4,513,572, Cl. 60-618.000.
Societe dite: USINES BEYER FRERES: *See*—
Poulin, Jean L., 4,514,164, Cl. 425-208.000.
Societe Europeenne De Propulsion: *See*—
Heraud, Louis, 4,514,240, Cl. 156-89.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Dubreuil, Jean-Pierre; Blazejczak, Jean; and Tramier, Bernard, 4,514,272, Cl. 204-186.000.
Hubert, Miffre, 4,513,816, Cl. 166-75.00R.
Sodergren, Jan H.; and Hales, James W., to Combustion Engineering, Inc. Mechanical tube plub. 4,513,786, Cl. 138-89.000.
Soederhuyzen, Eduard. Fluid distribution system. 4,513,767, Cl. 137-119.000.
Sofiltra Poelman: *See*—
Develle, Guy; and Martin, Gerard, 4,514,198, Cl. 55-337.000.
Sofy, Hugh M. Transfer device. 4,513,602, Cl. 72-405.000.
Sokulski, Marek: *See*—
Balinski, Ryszard; and Sokulski, Marek, 4,513,658, Cl. 99-485.000.
Soldati, Gianfraco: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Soletanche: *See*—
Gouvenot, Daniel, 4,514,228, Cl. 106-98.000.
Solex (U.K.) Limited: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,513,728, Cl. 123-527.000.
Sorensen, Sven: *See*—
Rishovd, Erik; and Sorensen, Sven, 4,513,765, Cl. 137-72.000.
Southland Instruments, Inc.: *See*—
Lee, Peter F., 4,513,754, Cl. 128-753.000.
Southwest Research Institute: *See*—
De Los Santos, Armando; King, James D.; Rollwitz, William L.; Matzkanin, George A.; and Hornung, Phillip A., 4,514,691, Cl. 324-301.000.
Southworth, Glen R.; and Johnson, Bruce F., to Colorado Video, Incorporated. Spectrum conservation in encoded color TV signals. 4,514,753, Cl. 358-11.000.
Spector, George: *See*—
Anderson, Alan; and Spector, George, 4,513,454, Cl. 2-246.000.
Pedrick, Joseph F.; and Spector, George, 4,513,801, Cl. 152-213.00R.
Spencer, William H.; and Anderberg, Thomas E., to Bell & Howell Company. Bus system architecture and microprocessor system. 4,514,799, Cl. 364-200.000.
Speranza, George P.: *See*—
Sellstrom, Kathy B.; and Speranza, George P., 4,514,530, Cl. 523-456.000.

Sperner, Franz: *See*—
Aldinger, Fritz; Bischoff, Albrecht; Keilberth, Richard; and Sperner, Franz, 4,514,589, Cl. 174-119.00R.
Sperry Corporation: *See*—
Strubbe, Gilbert J. I., 4,513,562, Cl. 56-10.200.
Spie-Batignolles: *See*—
Chabrier, Gilbert, 4,514,245, Cl. 156-161.000.
Spiewok, Leonhard: *See*—
Rettich, Jakob; and Spiewok, Leonhard, 4,513,464, Cl. 8-159.000.
Spiral Systems Instruments, Inc.: *See*—
Schalkowsky, Samuel; and Schalkowsky, Ellen R., 4,514,495, Cl. 435-32.000.
Spitsbergen, Merlin D., to Centronics Data Computer Corp. Web loop control apparatus and method. 4,513,898, Cl. 226-44.000.
Sprague Electric Company: *See*—
Lucey, Michael F., 4,514,468, Cl. 428-418.000.
Spurling, Robert A.; Davis, Burton I.; and Taylor, Norman G., to Rockwell International Corporation. Device for preparing thin specimens. 4,513,537, Cl. 51-71.000.
Square D Company: *See*—
Buchanan, James D., 4,514,601, Cl. 200-5.00E.
Maulandi, Aymon A., 4,514,025, Cl. 339-64.00M.
SRI International: *See*—
Bartlett, Robert W., 4,514,580, Cl. 136-250.000.
Stace, Richard J. L., to Ford Motor Company. Internal combustion engine and cylinder head therefor. 4,513,709, Cl. 123-306.000.
Stackhouse, Wells F., to American Locker Security Systems, Inc. Coin counting and release mechanism. 4,513,851, Cl. 194-51.000.
Staendeke, Horst; Dany, Franz-Josef; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Particulate material reducing the ignitability of combustible substances. 4,514,328, Cl. 252-609.000.
Staffa, Karl-Heinz: *See*—
Humpolik, Bohumil; and Staffa, Karl-Heinz, 4,513,587, Cl. 62-515.000.
Stamicarbon B.V.: *See*—
Weterings, Cornelis A. M.; and Janssen, Johannes A., 4,514,365, Cl. 423-15.000.
Standard Oil Company, The: *See*—
McGarry, Phillip E.; Herman, David E.; Treskot, Robert A.; and Fistner, David C., Sr., 4,514,291, Cl. 209-166.000.
Standard Oil Company (Indiana): *See*—
Alteepping, Josef; and Bornemann, Dietrich E., 4,514,463, Cl. 428-286.000.
Cousineau, Thomas J.; and Cengel, John A., 4,514,190, Cl. 44-70.000.
Lautzenhiser, Theodore V., 4,513,618, Cl. 73-382.00G.
Mahoney, John A.; Helstrom, John J.; and Tait, A. Martin, 4,514,279, Cl. 208-10.000.
Puskas, Imre, 4,514,516, Cl. 502-202.000.
Stanton, Joseph J.: *See*—
Bishop, Timothy E.; Stanton, Joseph J.; Pasternack, George; and Cutler, Orvid R., Jr., 4,514,037, Cl. 350-96.230.
Staples, Paul R., to E.M.B. Corporation. Door operated switch assembly. 4,514,603, Cl. 200-61.620.
Stark, Glenn; and Barton, David M., to Victor Technologies Inc. Method and apparatus for improving disk storage capacity. 4,514,771, Cl. 360-73.000.
Starp, Franz; and Deisenroth, Werner. Mechanism for indicating and setting the parameters of exposure aperture and/or exposure time for photographic cameras. 4,514,066, Cl. 354-273.000.
Starr, Thomas J. J., to AT&T Bell Laboratories. Method and apparatus for bus fault location. 4,514,845, Cl. 371-15.000.
Stauffer Chemical Company: *See*—
Fesman, Gerald, 4,514,524, Cl. 521-107.000.
Heather, James B.; and Kanne, David B., 4,514,215, Cl. 71-107.000.
Steckler, Steven A.: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,514,760, Cl. 358-143.000.
Stein, Stanley I.: *See*—
Cade, J. Weldon; and Stein, Stanley I., 4,514,135, Cl. 414-682.000.
Steinback, Clarence I., to Acrometal Products, Inc. Position setting device for abrasive belt grinding machine. 4,513,539, Cl. 51-138.000.
Steiner, Erwin, to Technology Consulting Corporation. Apparatus and method for the heat treatment of yarn. 4,513,514, Cl. 34-24.000.
Steinke, Mark H., to Lyon Metal Products, Incorporated. Shelving structure and clip used therein. 4,513,669, Cl. 108-111.000.
Steinmann, Peter; and Sutor, Norbert, to Siemens Aktiengesellschaft. Cable with an outer jacket of gnaw resistant material. 4,514,035, Cl. 350-96.230.
Stenerson, Gary K.: *See*—
McMath, Henry G.; and Stenerson, Gary K., 4,514,168, Cl. 432-14.000.
Stephens, James B.; Yang, Mary M.; and Laue, Eric G., to United States of America, National Aeronautics and Space Administration. Trace water sensor. 4,514,278, Cl. 204-430.000.
Stephens, Robert; and Clark, Raymond, to Applied Power Inc. Suspension system for a tilt cab truck. 4,513,845, Cl. 188-299.000.
Steprath, Werner; and Weigle, Dieter, to Robert Bosch GmbH. Hydraulic control arrangement for actuating lifting mechanism of an agricultural machine. 4,513,826, Cl. 172-7.000.
Sterling Drug Inc.: *See*—
Hain, Robert W.; Hadtke, Frederick B.; and Paikoff, Myron, 4,513,891, Cl. 222-213.000.
Sternberg, Rudolf; and Schnapper, Martin, to Daimler-Benz Aktiengesellschaft. Valve for an internal combustion engine. 4,513,701, Cl. 123-188.0AA.
Stevenson, Paul D., to General Motors Corporation. Transmission shift control. 4,513,640, Cl. 74-870.000.
Stewart, Duncan: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Dolenc, Anton; and Rollenitz, Leopold, 4,513,714, Cl. 123-357.000.
Stine, Edward V. Apparatus for measuring refractive properties of lenses and other transmissive devices. 4,514,086, Cl. 356-124.000.
Stites, David G., to Bell & Howell Company. Dove prism for convergent light paths. 4,514,050, Cl. 350-444.000.
Stock, Horst: *See*—
Lossl, Gunter; Zauhar, Helmut; and Stock, Horst, 4,513,544, Cl. 51-283.00R.
Stol, Israel, to Invocas, Inc. Fastener improvement including introduction of selected capsule of adhesive into porous basket hung in bore for activation by fastener installation. 4,514,125, Cl. 411-82.000.
Stol, Israel, to Westinghouse Electric Corp. Pressure-differential method for sleeve-to-tube joining. 4,514,614, Cl. 219-125.110.
Stoll, Wolfgang; and Ennerst, Karl, to Alkem GmbH. Method for reprocessing a nuclear reactor fuel rod. 4,514,364, Cl. 423-4.000.
Stoltman, Donald D., to General Motors Corporation. Pressure regulator. 4,513,775, Cl. 137-491.000.
Stone, Robert P., to RCA Corporation. Arc-suppression means for an electron gun having a split electrode. 4,514,661, Cl. 315-3.000.
Stowe, David W., to Gould Inc. Quadrature fiber-optic interferometer matrix. 4,514,054, Cl. 350-96.150.
Stower, James F.: *See*—
Goldberger, Robert D.; and Stower, James F., 4,514,434, Cl. 426-646.000.
Strasser, Thomas. Desk lock system. 4,514,020, Cl. 312-220.000.
Strelnikov, Alexandr A.: *See*—
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., 4,513,620, Cl. 73-664.000.
Strohmaier, Ernst, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,514,169, Cl. 433-29.000.
Strope, Douglas H.: *See*—
Engel, Peter A.; Strope, Douglas H.; and Wray, Thomas E., 4,514,752, Cl. 357-72.000.
Strubbe, Gilbert J. I., to Sperry Corporation. Combine ground speed control system. 4,513,562, Cl. 56-10.200.
Stry-Lenkoff Co.: *See*—
Lenkoff, Leon G., 4,514,177, Cl. 434-328.000.
Stuhler, Rolf: *See*—
Majthan, Rudolf; Stuhler, Rolf; Parsonage, Raymond G.; and Packham, Charles C., 4,514,618, Cl. 219-370.000.
Sudbeck, Rainer; and Baumgartner, Hans, to Pierburg GmbH & Co. KG. Rotary vane pump with clutch. 4,514,153, Cl. 418-69.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., KG: *See*—
Humpolik, Bohumil; and Staffa, Karl-Heinz, 4,513,587, Cl. 62-515.000.
Suehiro, Tetsuro: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Suga, Michihisa; and Tsuzuki, Mitsuo, to Nippon Electric Co., Ltd. Printer head for an ink-on-demand type ink-jet printer. 4,514,742, Cl. 346-140.00R.
Sugimoto, Kenji; and Isozaki, Osamu, to Taisei Corporation; and Kansai Paint Co., Ltd. Process for the preparation of electron beam curing gypsum panel. 4,514,471, Cl. 428-703.000.
Sugiura, Noboru: *See*—
Ishii, Toshio; and Sugiura, Noboru, 4,513,718, Cl. 123-425.000.
Sugiura, Ryuzo: *See*—
Kikuchi, Junzo; Sugiura, Ryuzo; Yamamoto, Mutsuhiro; and Yoshida, Toshiro, 4,514,597, Cl. 179-99.00M.
Sugiyama, Kenji; and Miyazaki, Takeshi, to Toyoda Gosei Co., Ltd. Process for manufacturing a hose mouthpiece. 4,513,489, Cl. 29-520.000.
Sullivan, Jack W. Ball and socket linkage and bearing assembly. 4,514,015, Cl. 308-2.00R.
Sulzer Brothers Limited: *See*—
Lincke, Paul, 4,513,792, Cl. 139-439.000.
Russak, Steffen P., 4,513,943, Cl. 251-31.000.
Sulzer-Escher Wyss Ltd.: *See*—
Rettich, Jakob; and Spiewok, Leonhard, 4,513,464, Cl. 8-159.000.
Sumerau, William R.; and Laing, Gordon E., to Singer Company, The. Filter bag for floor care appliance. 4,514,200, Cl. 55-368.000.
Sumita, Osao: *See*—
Furutani, Yasumasa; Hira, Yasuo; Hasegawa, Takashi; Minato, Akira; Sumita, Osao; and Itow, Hisao, 4,514,270, Cl. 204-151.000.
Sumitomo Chemical Company, Limited: *See*—
Ohsumi, Tadashi; Hatakoshi, Makoto; and Kisida, Hirosi, 4,514,406, Cl. 514-352.000.
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
Yamahira, Yoshiya; Shima, Katsuhiko; Matsusaka, Chikako; and Noguchi, Tetsuo, 4,514,386, Cl. 424-81.000.
Sumitomo Electric Industries, Ltd.: *See*—
Abe, Hiroshi; Sato, Nobuhiro; Ono, Kimizo; and Hirano, Kazuo, 4,513,751, Cl. 128-666.000.
Summagraphics Corporation: *See*—
Whetstone, Albert L., 4,514,688, Cl. 324-208.000.

Sundermeier, Gunter; and Waltemate, Dieter, to Paul Hettich & Co. Cabinet with double door consisting of an inner door and an outer door. 4,514,021, Cl. 312-291.000.

Sundstrand Corporation: *See*—
Olson, Raymond N., 4,514,652, Cl. 310-54.000.

Suntory Limited: *See*—
Yoshizumi, Hajime; Matsumoto, Nobuya; Fukuda, Osamu; and Fukushi, Osamu, 4,514,496, Cl. 435-162.000.

Susz, Dietfried, to U.S. Philips Corporation. Circuit arrangement for generating an actuating signal for a piezo-electric element of a positioning device. 4,514,773, Cl. 360-77.000.

Sutor, Norbert: *See*—
Steinmann, Peter; and Sutor, Norbert, 4,514,035, Cl. 350-96.230.

Suzuki, Hayao, to Seiko Instruments & Electronics Ltd. Pulse width modulation d.c. servo motor driving circuit. 4,514,666, Cl. 318-293.000.

Suzuki, Hitoshi: *See*—
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, 4,513,702, Cl. 123-193.00H.

Suzuki, Kuniaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Printing head driving apparatus. 4,514,737, Cl. 346-76.0PH.

Suzuki, Mitsuo: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.

Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,513,929, Cl. 242-198.000.

Suzuki, Takanori: *See*—
Koga, Noritaka; Suzuki, Takanori; Nakamura, Kenji; Suzuki, Hitoshi; and Ogano, Takeo, 4,513,702, Cl. 123-193.00H.

Suzuki, Takashi; Shinohara, Koichi; Odagiri, Masaru; Fujita, Takashi; and Kawase, Shigeki, to Matsushita Electric Industrial Co., Ltd. Polyester substrate for magnetic recording medium having oligomer protrusions thereon. 4,514,451, Cl. 428-141.000.

Suzuki, Toshihiro: *See*—
Sawa, Natsuo; Suzuki, Toshihiro; and Okazaki, Shinji, 4,514,556, Cl. 528-117.000.

Suzuki, Toshitake; Arai, Naoto; Aoyagi, Shoji; Saito, Toranosuke; Kitani, Masakatsu; and Ishibashi, Takashi, to Kanzaki Paper Manufacturing Co. Ltd.; and Sanko Kaihatsu Kagaku Kenkyusho Corporation. Heat-sensitive recording material. 4,514,745, Cl. 346-216.000.

Suzuki, Yoshiharu; Fukagawa, Hitoshi; Komoda, Yoshiyuki; and Tanaka, Osamu, to Matsushita Electric Works, Ltd. Data transmission system utilizing power line of 3-phase alternating current. 4,514,719, Cl. 340-310.00R.

Suzuki, Yoshihisa; Yasui, Yoshiharu; Seiki, Kazuo; and Takasu, Shigeru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Easily displaceable bottom tenser. 4,513,481, Cl. 19-244.000.

Svenska Traforskningsinstitutet: *See*—
Karlsson, Hakan I.; and Pettersson, Jan G. T., 4,514,257, Cl. 162-49.000.

Svoboda, Josef, to TMC Corporation. Device for cross-country skiing. 4,513,988, Cl. 280-615.000.

Swanson, Ronald C. Measuring tool. 4,513,510, Cl. 33-419.000.

Sweeney, William M.: *See*—
Lu-Dai Sung, Rodney; Sweeney, William M.; and Zoleski, Benjamin H., 4,514,311, Cl. 252-32.500.

Swiatkowski, Piotr; and Wiklund, Thomas, to KenoGard AB. Flotation collector composition and its use. 4,514,290, Cl. 209-166.000.

Swing Stage Limited: *See*—
Vandelinde, Henry, 4,513,952, Cl. 254-285.000.

Swoboda, Gary L.: *See*—
Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., 4,514,801, Cl. 364-200.000.
McDonough, Kevin C.; Swoboda, Gary L.; and Magar, Surendar S., 4,514,805, Cl. 364-200.000.

Swoboda, Thomas J., to Du Pont de Nemours, E. I., and Company. Phosphorous-doped tin oxide powder. 4,514,322, Cl. 252-518.000.

Swoveland, Jack E., to Dana Corporation. Mounting bracket for a steering column control stalk. 4,513,632, Cl. 74-484.00R.

Symons, Edward A.; Rolston, John H.; Clermont, Michel J.; and Paterson, Linda M., to Atomic Energy of Canada Limited. Process for the exchange of hydrogen isotopes between streams of liquid water and gaseous halohydrocarbon and an apparatus therefor. 4,514,377, Cl. 423-648.00A.

Synthes AG: *See*—
Klaue, Kaj, 4,513,744, Cl. 128-92.00D.

Szabo, Ervin I., to Canadian Patents and Development Limited. Method of manufacturing a foundry mould mix containing a mould binder. 4,514,227, Cl. 106-38.200.

Szarka, Jay R. Environmental control system and method. 4,514,729, Cl. 340-825.060.

Szczesny, Adolf; Kleinert, Reiner; Jedo, Antoni; and Gutorski, Zygmunt, to Centrum Mechanizacji Gornictwa "Komag" . Dehydrating centrifugal sieve. 4,514,300, Cl. 210-342.000.

Szkaradek, Edward J., to Morehouse Industries, Inc. Sand mill rotor discs. 4,513,917, Cl. 241-46.110.

Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, to Kabushiki Kaisha Daini Seikosha. Heartbeat rate indicator. 4,513,753, Cl. 128-706.000.

Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state color imager with two layer three story structure. 4,514,755, Cl. 358-44.000.

Tabei, Tooru: *See*—
Sato, Giichi; Matuo, Tadashi; and Tabei, Tooru, 4,514,559, Cl. 534-690.000.

Tabuchi, Kenji: *See*—
Wada, Kenichi; Oka, Tateki; and Tabuchi, Kenji, 4,514,480, Cl. 430-30.000.

Tachi, Kunio: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.

Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, to Toyo Kogyo Co., Ltd. Multiple port intake means for rotary piston engines. 4,513,707, Cl. 123-242.000.

Taguchi, Toshio; Akino, Hisashi; and Nozawa, Takamitsu, to Shiseido Co., Ltd.; and Yoshino Kogyosho Co., Ltd. Container having spring biased hinge. 4,513,877, Cl. 220-335.000.

Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, to Nisshin Flour Milling Co., Ltd. Isoprenylamine derivatives. 4,514,573, Cl. 564-387.000.

Taisei Corporation: *See*—
Sugimoto, Kenji; and Isozaki, Osamu, 4,514,471, Cl. 428-703.000.

Tait, A. Martin: *See*—
Mahoney, John A.; Helstrom, John J.; and Tait, A. Martin, 4,514,279, Cl. 208-10.000.

Tajima, Ikuo, to Tokai Industrial Sewing Machine Co., Ltd. Embroidery sewing machine. 4,513,672, Cl. 112-100.000.

Takagiwa, Hiroyuki: *See*—
Kasuya, Takahira; Morita, Hideaki; Takagiwa, Hiroyuki; and Yamakawa, Goichi, 4,514,487, Cl. 430-137.000.
Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi, Kouichi, 4,514,486, Cl. 430-124.000.

Takahashi, Jiro: *See*—
Shirose, Meizo; Ito, Kunio; Takagiwa, Hiroyuki; Takahashi, Jiro; and Gunzi, Kouichi, 4,514,486, Cl. 430-124.000.

Takahashi, Reijiro: *See*—
Ito, Tosikazu; and Takahashi, Reijiro, 4,513,808, Cl. 165-43.000.

Takahashi, Toshihiko, to Takenaka Engineering Co., Ltd. Optical system for intruder detecting device. 4,514,630, Cl. 250-342.000.

Takahashi, Toshihiro: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.

Takahashi, Yoshio; and Shoji, Takeshi, to Mitsubishi Oil Company, Limited. Paper sizing agent comprised of reaction product of maleic anhydride and propylene oligomers. 4,514,544, Cl. 525-327.400.

Takamatsu, Takashi; and Ohnuki, Tetsuo, to Tokyo Keiki Company, Ltd. Gerotor power steering apparatus with driven rotary sleeve valve. 4,514,152, Cl. 418-61.00B.

Takasu, Shigeru: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; Seiki, Kazuo; and Takasu, Shigeru, 4,513,481, Cl. 19-244.000.

Takeda Chemical Industries, Ltd.: *See*—
Imada, Isuke; and Watanabe, Masazumi, 4,514,420, Cl. 514-689.000.
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,514,565, Cl. 544-25.000.

Takeda, Keisou; and Hirata, Toshiyuki, to Toyota Jidosha Kabushiki Kaisha. Fuel injection device for motor vehicle. 4,513,720, Cl. 123-470.000.

Takeda, Masashi: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.

Takei, Ryutaro: *See*—
Gunjima, Tomoki; and Takei, Ryutaro, 4,514,044, Cl. 350-350.00R.

Takei, Sumiaki: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.

Takemoto, Iwao: *See*—
Koike, Norio; Takemoto, Iwao; Ohba, Shinya; Masuhara, Toshiaki; and Kubo, Masaharu, 4,514,766, Cl. 358-213.000.

Takenaka, Akihiko; Arakawa, Miyao; Sato, Masahiro; and Yamaguchi, Toshiyuki, to Nippondenso Co., Ltd. Electromagnetic rotation detecting apparatus. 4,513,609, Cl. 73-116.000.

Takenaka Engineering Co., Ltd.: *See*—
Takahashi, Toshihiko, 4,514,630, Cl. 250-342.000.

Takimura, Keisuke; and Hamano, Hideo, to Toyota Jidosha Kabushiki Kaisha. Differential gear for automotive vehicles. 4,513,635, Cl. 74-713.000.

Talo, Leslie C.: *See*—
Fellner, Theodore F.; and Talo, Leslie C., 4,513,858, Cl. 198-812.000.

Tamashasky, Joseph A.: *See*—
Fegley, Charles R.; and Tamashasky, Joseph A., 4,513,852, Cl. 198-399.000.

Tamura Electric Works, Ltd.: *See*—
Kikuchi, Junzo; Sugiura, Ryuzo; Yamamoto, Mutsuhiro; and Yoshida, Toshiro, 4,514,597, Cl. 179-99.00M.

Tamura, Shingo: *See*—
Kadono, Motoaki; and Tamura, Shingo, 4,514,446, Cl. 428-35.000.

Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image making system and apparatus therefor. 4,514,081, Cl. 355-14.00R.

Tanabe, Takeshi: *See*—
Sakamoto, Yukio; and Tanabe, Takeshi, 4,514,782, Cl. 361-306.000.

Tanaka, Hiroaki, to Sharp Kabushiki Kaisha. Polarizer with electrode thereon in a liquid crystal display. 4,514,041, Cl. 350-337.000.

Tanaka, Kano; Ando, Yoshio; and Yanagawa, Hitoshi, to Canon Kabushiki Kaisha. Apparatus for retrieving information. 4,514,641, Cl. 250-570.000.
Tanaka, Kazuhiko: *See*—
Kubota, Yasuo; Tanaka, Kazuhiko; and Kikushima, Kazuyuki, 4,514,767, Cl. 358-280.000.
Tanaka, Kazuhiro; Kawakami, Ken-ichi; and Yoshii, Toshiya, to Toray Industries, Inc. Magnetic recording disk. 4,514,452, Cl. 428-141.000.
Tanaka, Osamu: *See*—
Suzuki, Yoshiharu; Fukagawa, Hitoshi; Komoda, Yoshiyuki; and Tanaka, Osamu, 4,514,719, Cl. 340-310.00R.
Tanaka, Yasushi: *See*—
Watanabe, Hiroyuki; and Tanaka, Yasushi, 4,514,008, Cl. 296-204.000.
Taniguchi, Itoji; and Kimura, Yoshiharu, to Idemitsu Kosan Company Limited. Process for the production of high molecular weight organoaluminum polymers. 4,514,555, Cl. 528-9.000.
Taniguchi, Nobuyuki; Hosomizu, Hiroshi; Inoue, Toru; Nakai, Masaaki; Omaki, Takanobu; Niwa, Masatake; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Automatic exposure control camera. 4,514,073, Cl. 354-414.000.
Tanner, Sally A.: *See*—
Garcia, Carlos N.; Rigg, Bryan C.; and Tanner, Sally A., 4,514,489, Cl. 430-327.000.
Tano, Eiichi: *See*—
Negishi, Kiyoshi; Kawasaki, Masahiro; and Tano, Eiichi, 4,514,075, Cl. 354-446.000.
Tardivel, Georges M.: *See*—
Tardivel, Monique M., 4,513,461, Cl. 5-413.000.
Tardivel, Monique M., to Tardivel, Georges M. Sleeping bag with removable sheet. 4,513,461, Cl. 5-413.000.
Tashiro, Chiaki; Kawakita, Takeshi; Horii, Ichiro; and Anami, Koretake, to Yoshitomi Pharmaceutical Industries Ltd. Hydrouracil compounds. 4,514,403, Cl. 514-274.000.
Tassler, Milford C.: *See*—
Hsu, Oscar H. H.; and Tassler, Milford C., 4,514,532, Cl. 524-14.000.
Tate, Takao: *See*—
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Tateishi, Terutaka; and Shimizu, Kazuyuki, to Fujitsu Limited. Key storage error processing system. 4,514,847, Cl. 371-51.000.
Tateoka, Masamichi; and Ogata, Yukihiko, to Canon Kabushiki Kaisha. Apparatus for reading an original surface by illuminating it with a slit-like beam. 4,514,626, Cl. 250-235.000.
Tateosian, Louis H.: *See*—
Dougherty, Emery W.; Heyde, John B.; Bennett, Richard J.; Smith, Roy L.; Tateosian, Louis H.; and Eden, George T., 4,514,174, Cl. 433-226.000.
Taylor, Frank; and Maurer, Klemens, to Monitronik Ltee. Self-supporting element for mosaic display panel. 4,514,104, Cl. 403-14.000.
Taylor, James A., Jr.: *See*—
Eckelt, Peter; and Taylor, James A., Jr., 4,513,647, Cl. 83-203.000.
Taylor, Norman G.: *See*—
Spurling, Robert A.; Davis, Burton I.; and Taylor, Norman G., 4,513,537, Cl. 51-71.000.
Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Bader, Edgar; Rohrbach, Gerd; Petersen, Jurgen; and Kittel, Ludwig, 4,514,840, Cl. 370-29.000.
Teac Corporation: *See*—
Kudo, Tomio, 4,514,777, Cl. 360-128.000.
Technigaz: *See*—
Kotcharian, Michel, 4,513,550, Cl. 52-249.000.
Technology Consulting Corporation: *See*—
Steiner, Erwin, 4,513,514, Cl. 34-24.000.
Tegeler, John J.; and Diamond, Craig J., to Hoechst-Roussel Pharmaceuticals Inc. Substituted 8-phenylisoxazolo[4,3-e][1,4]diazepin-5-ones. 4,514,410, Cl. 514-221.000.
Tekna Limited: *See*—
Tremblay, Paul, 4,513,503, Cl. 30-289.000.
Tektronix, Inc.: *See*—
Payne, David G., 4,514,022, Cl. 339-17.00F.
Telefonaktiebolaget LM Ericsson: *See*—
Sem-Sandberg, Sverre G., 4,514,841, Cl. 370-55.000.
Telescope Folding Furniture Co. Inc., The: *See*—
Vanderminden, Robert D.; and Parker, Paul, 4,514,009, Cl. 297-27.000.
Tempmaster Corporation: *See*—
Humphreys, Norman G.; and Dean, Raymond H., 4,513,574, Cl. 62-59.000.
Terabe, Mahito: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ito, Koichi; Ishida, Masaaki; Matsui, Kazuhiko; Makamori, Shigeru; and Sano, Konosuke, 4,514,502, Cl. 435-253.000.
Terai, Ryohei: *See*—
Wakabayashi, Hajimu; Terai, Ryohei; Yamanaka, Hiroshi; and Hara, Shigeo, 4,514,329, Cl. 252-629.000.
Teramachi, Hiroshi. Linear slide bearing and linear slide table unit employing the same. 4,514,018, Cl. 308-6.00C.
Terasawa, Yoshio: *See*—
Miyata, Kenji; Terasawa, Yoshio; Oikawa, Saburo; Murakami, Susumu; and Okamura, Masahiro, 4,514,747, Cl. 357-38.000.
Teraura, Makoto, to Nippon Cable System, Inc. Boat steering mechanism. 4,513,680, Cl. 114-159.000.
Terrenzio, Gabriel M., to Acrowood Corporation. Feed arrangement for a centrifugal rock crusher. 4,513,919, Cl. 241-275.000.
Tesla, koncernovy podnik: *See*—
Janda, Jiri; and Hrdlicka, Karel, 4,514,838, Cl. 369-254.000.
Teuscher, Othmar: *See*—
Bisquolm, Werner; Burki, Jorg; and Teuscher, Othmar, 4,513,480, Cl. 19-113.000.
Texaco Inc.: *See*—
Lu-Dai Sung, Rodney; Sweeney, William M.; and Zoleski, Benjamin H., 4,514,311, Cl. 252-32.500.
Maddox, Jim, Jr., 4,513,820, Cl. 166-266.000.
Meador, Richard A., 4,514,693, Cl. 324-338.000.
Niccum, Phillip K.; and Bunn, Dorrance P., Jr., 4,514,285, Cl. 208-148.000.
Richter, Albert P., Jr.; Campsey, Ronald L.; Paap, Hans J.; and Bussian, Alfred E., 4,514,627, Cl. 250-255.000.
Rundell, Herbert A.; and Savage, Kerry D., 4,513,815, Cl. 166-57.000.
Sellstrom, Kathy B.; and Speranza, George P., 4,514,530, Cl. 523-456.000.
Texas Instruments Incorporated: *See*—
Adams, Anthony L., 4,514,750, Cl. 357-70.000.
Caudel, Edward R.; Swoboda, Gary L.; Magar, Surendar S.; McDonough, Kevin C.; and Leigh, Antony W., 4,514,801, Cl. 364-200.000.
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,514,828, Cl. 365-8.000.
Doherty, John, Jr., 4,514,717, Cl. 337-365.000.
McDonough, Kevin C.; Swoboda, Gary L.; and Magar, Surendar S., 4,514,805, Cl. 364-200.000.
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, to Lotte Co., Ltd. Process of preparing an improved bubble chewing gum. 4,514,423, Cl. 426-3.000.
Thaler, Arnold: *See*—
Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, 4,513,735, Cl. 128-24.200.
Therm-O-Type Corporation: *See*—
Wilkinson, John S., 4,514,779, Cl. 361-213.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for removing surface irregularities from a rail head of a railroad track. 4,514,124, Cl. 409-295.000.
Thilo, Peer: *See*—
Oberstein, Karla; and Thilo, Peer, 4,514,720, Cl. 340-511.000.
Thomas, Charles R. Therapeutic pillow. 4,513,462, Cl. 5-442.000.
Thomas, Frank O. Emergency medical pack. 4,513,866, Cl. 206-570.000.
Thomas, John H.: *See*—
Owoc, James R.; Thomas, John H.; and Conley, Richard W., 4,513,779, Cl. 137-556.000.
Thomas, Michael J.; and McDonald, David B., to General Motors Corporation. Air valve. 4,513,771, Cl. 137-315.000.
Thompson, James E.: *See*—
Beers, Melvin D.; and Thompson, James E., 4,514,529, Cl. 523-200.000.
Thompson, John A., to Henkel Corporation. Leather treatment composition and leather treating. 4,514,184, Cl. 8-94.210.
Thompson, William J., to Rockwell International Corporation. Second or higher order PLL with increased low and medium frequency gain. 4,514,706, Cl. 331-16.000.
Thomson-CSF: *See*—
Charruau, Stephane, 4,514,786, Cl. 361-413.000.
Contartese, Giulio; and Dietz, Joachim, 4,513,782, Cl. 137-625.630.
Nuzillat, Gerard; and Bert, Georges, 4,514,649, Cl. 307-450.000.
Pichon, Laurence; and Huignard, Jean P., 4,514,038, Cl. 350-162.130.
Thorn, Richard P.; and Gupta, Bhagwati P., to Lord Corporation. Spring-like material formed of compressed metallic wire. 4,514,458, Cl. 428-222.000.
Thurber, Robert J., to Wahl Clipper Corporation. Cushioned massager. 4,513,736, Cl. 128-41.000.
Thyes, Marco: *See*—
Ostersehlt, Bernd; Franke, Albrecht; Frickel, Fritz-Frieder; Thyes, Marco; Friedrich, Ludwig; Gries, Josef; and Lenke, Dieter, 4,514,413, Cl. 514-397.000.
Tiedje, Thomas; and Abeles, Benjamin, to Exxon Research and Engineering Co. Optical absorption enhancement in amorphous silicon deposited on rough substrate. 4,514,582, Cl. 136-256.000.
Tihonovich, Walter. Hinged hair curling roller. 4,513,760, Cl. 132-40.000.
Tilbor, Neil: *See*—
Mucaro, Salvatore A.; and Tilbor, Neil, 4,513,966, Cl. 273-68.00B.
Tippins Machinery Company, Inc.: *See*—
Ginzburg, Vladimir B.; and Snitkin, Sidney R., 4,513,594, Cl. 72-8.000.
Titan Tool Company: *See*—
McKean, John A., 4,513,643, Cl. 81-53.200.
Tiuri, Martti: *See*—
Heikkila, Sakari; and Tiuri, Martti, 4,514,680, Cl. 324-58.50A.
TMC Corporation: *See*—
Svoboda, Josef, 4,513,988, Cl. 280-615.000.
Toa Grout Kogyo Co., Ltd.: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.
Tobishi Industries Ltd.: *See*—
Hosoya, Toshiro, 4,514,655, Cl. 310-218.000.
Tobita, Katsumi: *See*—
Noji, Tasuku; and Tobita, Katsumi, 4,514,757, Cl. 358-86.000.

Toda Kogyo Corp.: *See*—
Mishima, Akio; Okuda, Yoshiro; Harada, Tosiharu; Mukaizaka, Akira; and Imai, Tomoyuki, 4,514,216, Cl. 75-0.5AA.

Togashi, Minoru; Kato, Kenshiro; and Furuya, Shin-ichi, to Bridgestone Tire Company Limited. Reduced rolling resistance pneumatic radial tire and method of manufacturing the same. 4,513,802, Cl. 152-353.00R.

Tokai Industrial Sewing Machine Co., Ltd.: *See*—
Tajima, Ikuo, 4,513,672, Cl. 112-100.000.

Tokai Rubber Industries, Ltd.: *See*—
Morita, Yasuhiro; and Tsukamoto, Yoshikazu, 4,513,990, Cl. 280-725.000.

Tokieda, Naomitsu. Lamp ribbon. 4,514,791, Cl. 362-249.000.

Tokunaga, Isao: *See*—
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, 4,514,459, Cl. 428-229.000.

Tokuyama, Yoshio, to Victor Company of Japan, Ltd. D.C. Motor driving circuit. 4,514,668, Cl. 318-294.000.

Tokyo Keiki Company, Ltd.: *See*—
Takamatsu, Takashi; and Ohnuki, Tetsuo, 4,514,152, Cl. 418-61.00B.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Hattori, Motoichi; and Ishigo, Hideyasu, 4,514,593, Cl. 179-2.00A.
Inagaki, Taizo; Ichikawa, Kentaro; Kido, Hitoshi; and Kawase, Yozo, 4,514,138, Cl. 415-1.000.
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.
Ishizawa, Toshimichi, 4,514,768, Cl. 358-296.000.
Iwata, Kazuhide; Shibayama, Shigeki; Hidai, Yutaka; and Oyanagi, Shigeru, 4,514,826, Cl. 364-900.000.
Kariatsumari, Keiichiro; and Hirai, Kenji, 4,514,699, Cl. 330-53.000.
Kawabuchi, Katsuhiro, 4,514,233, Cl. 148-1.500.
Mizobuchi, Norihiro; Furukawa, Keiji; and Motoyama, Takeshi, 4,513,581, Cl. 62-197.000.
Murayama, Masaki; and Iida, Manjiro, 4,514,808, Cl. 364-200.000.
Nagato, Hitoshi; Izawa, Koji; and Hirahara, Shuzo, 4,514,738, Cl. 346-76.0PH.
Suzuki, Kuniaki, 4,514,737, Cl. 346-76.0PH.

Toman, George M.: *See*—
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,513,674, Cl. 112-220.000.

Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives. 4,514,401, Cl. 514-253.000.

Tomkins Co., The: *See*—
Tompkins, Roy J., Jr., 4,513,797, Cl. 141-198.000.

Tommaney, Joseph W.; and Bishop, Harry L., Jr., to Allegheny Ludlum Steel Corporation. Method for producing steel in a top-blown vessel. 4,514,220, Cl. 75-60.000.

Tompkins, Roy J., Jr., to Tomkins Co., The. One-piece liquid filler tube. 4,513,797, Cl. 141-198.000.

Tonan Kaihatsu/Kogyo Co., Ltd.: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,514,112, Cl. 405-269.000.

Topinka, George F., to Carter Controls, Inc. Hydraulically actuated pump. 4,514,148, Cl. 417-403.000.

Toray Industries, Inc.: *See*—
Negishi, Takao; and Kojima, Teiryo, 4,513,565, Cl. 57-236.000.
Tanaka, Kazuhiro; Kawakami, Ken-ichi; and Yoshii, Toshiya, 4,514,452, Cl. 428-141.000.

Toray Silicone Company, Ltd.: *See*—
Kadono, Motoaki; and Tamura, Shingo, 4,514,446, Cl. 428-35.000.

Torii & Co. Ltd.: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.

Torii, Masahiro: *See*—
Tabata, Junichi; Torii, Masahiro; Oikawa, Hiroshi; Sawada, Minoru; and Masui, Yasuyuki, 4,513,753, Cl. 128-706.000.

Torisu, Yoshio: *See*—
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.

Tortrix A/S: *See*—
Pedersen, Jan B., 4,513,920, Cl. 242-4.00B.

Toscano, Luciano, to Pierrel Spa. Fluorinated erythromycin compounds and a process for preparation. 4,514,562, Cl. 536-7.200.

Toshiba Ceramics Co., Ltd: *See*—
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Iguchi, Katsuhiko; Wada, Hidemi; and Wakita, Ryuichi, 4,514,348, Cl. 264-40.100.

Toso Kabushiki Kaisha: *See*—
Mase, Ryoichi, 4,513,805, Cl. 160-299.000.

Toth Aluminum Corporation: *See*—
Wyndham, Ronald, 4,514,373, Cl. 423-495.000.

Tou, Jacob S.; and Schleppnik, Alfred A., to Monsanto Company. Cyano-polycarboxylates. 4,514,340, Cl. 260-465.00D.

Tovey, Hugh J.: *See*—
Aranyi, Ernie; Ihasz, Richard; Gravener, Roy D.; and Tovey, Hugh J., 4,513,746, Cl. 128-334.00C.

Tower, John R., to RCA Corporation. Electro-optical CCD transversal filter with analog reference weights. 4,514,821, Cl. 364-862.000.

Towmotor Corporation: *See*—
Melocik, Grant C.; and Pickering, William, 4,514,665, Cl. 318-139.000.

Townsend, Greg M.: *See*—
Maher, John W.; and Townsend, Greg M., 4,514,703, Cl. 330-279.000.

Toya, Syouichi, to Sanyo Electric Co., Ltd. Combined structure of hand-held cordless vacuum cleaner and flashlight. 4,513,470, Cl. 15-328.000.

Toyo Kogyo Co., Ltd.: *See*—
Fujii, Hiroshi; and Sakamoto, Toshiharu, 4,513,696, Cl. 123-41.020.
Tadokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,513,707, Cl. 123-242.000.

Toyo Soda Manufacturing Ltd.: *See*—
Miyaki, Yoshiyuki; Fujita, Yoshitaka; Se, Kazunori; and Fujimoto, Teruo, 4,514,304, Cl. 210-638.000.

Toyoda Gosei Co., Ltd.: *See*—
Sugiyama, Kenji; and Miyazaki, Takeshi, 4,513,489, Cl. 29-520.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Ina, Toshikazu; Obayashi, Hideki; Kawai, Hisasi; Kohama, Tokio; Sawada, Daisaku; and Shigematsu, Takashi, 4,513,721, Cl. 123-478.000.
Kobayashi, Nobuyuki; Ito, Hiroshi; and Ohkawa, Nobuhisa, 4,513,710, Cl. 123-339.000.
Kobayashi, Tatsuo, 4,513,717, Cl. 123-425.000.
Otsuki, Hiromi; Kondo, Takashi; Kondo, Yoshiaki; Obata, Haruyuki; Tate, Takao; and Ishikawa, Norikatu, 4,513,945, Cl. 251-129.000.
Sakurai, Shigenori; Kamo, Takashi; Furutani, Toshinobu; Kimura, Shirou; Torisu, Yoshio; and Okazaki, Mari, 4,514,277, Cl. 204-424.000.
Shimoji, Koji; Hangeisi, Suekiti; and Itou, Keiji, 4,513,841, Cl. 181-252.000.
Takeda, Keisou; and Hirata, Toshiyuki, 4,513,720, Cl. 123-470.000.
Takimura, Keisuke; and Hamano, Hideo, 4,513,635, Cl. 74-713.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Watanabe, Hiroyuki; and Tanaka, Yasushi, 4,514,008, Cl. 296-204.000.

Toyota Kidosha Kabushi Kaisha: *See*—
Morita, Yasuhiro; and Tsukamoto, Yoshikazu, 4,513,990, Cl. 280-725.000.

Trahan, Fred. Crab meat extracting device. 4,513,478, Cl. 17-71.000.

Tramier, Bernard: *See*—
Dubreuil, Jean-Pierre; Blazejczak, Jean; and Tramier, Bernard, 4,514,272, Cl. 204-186.000.

Travers, Christine; Chan, Trinh D.; Snappe, Roger; and Bournonville, Jean-Paul, to Institut Francais du Petrole. Process for manufacturing a catalyst comprising rhodium and at least one metal selected from the group consisting of tin, germanium and lead and the catalyst produced by the process. 4,514,515, Cl. 502-154.000.

Treadwell, William A., to Eaton Corporation. Vehicle speed control. 4,513,836, Cl. 180-177.000.

Treiber, Fritz F., to Hobart Corporation. Jam detection and removal for wrapping machine. 4,513,558, Cl. 53-77.000.

Tremblay, Paul, to Tekna Limited. Wire cutting tool. 4,513,503, Cl. 30-289.000.

Treskot, Robert A.: *See*—
McGarry, Phillip E.; Herman, David E.; Treskot, Robert A.; and Fistner, David C., Sr., 4,514,291, Cl. 209-166.000.

Trilog, Inc.: *See*—
Melissa, Raymond F.; Grummett, Lorne H.; and Chamberlain, John C., 4,513,661, Cl. 101-93.040.

Trimble, James L. Bicycle frame. 4,513,986, Cl. 280-281.00R.

Triner, Irvin R.; and Martinowich, John N., to Methode Electronics, Inc. Shorting edge connector. 4,514,030, Cl. 339-176.0MP.

Trion Corporation: *See*—
Aoki, Akio, 4,513,450, Cl. 2-19.000.

Trube & Kings Kommanditgesellschaft: *See*—
Breithaupt, Albert, 4,513,552, Cl. 52-400.000.

TRW Inc.: *See*—
Blumenthal, Jack L.; Ogren, John R.; Rutkowski, Eugene V.; and Appel, Marvin, 4,514,698, Cl. 330-4.300.
Van Antwerp, Joel C., 4,514,727, Cl. 340-793.000.

Tsai, Yeh C. Rewinding apparatus for video cassette. 4,513,927, Cl. 242-191.000.

Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorized two-wheeled vehicle. 4,513,838, Cl. 180-219.000.

Tsuchiyama, Tadashi: *See*—
Senga, Akihisa; Hidaka, Yoshiaki; and Tsuchiyama, Tadashi, 4,513,698, Cl. 123-52.0MV.

Tsudakoma Corp.: *See*—
Sainen, Tsutomu; Sakano, Toshiyuki; Fujita, Yoshitaka; and Imai, Toshiki, 4,513,790, Cl. 139-110.000.

Tsuge, Akihiko: *See*—
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.

Tsukamoto, Yoshikazu: *See*—
Morita, Yasuhiro; and Tsukamoto, Yoshikazu, 4,513,990, Cl. 280-725.000.

Tsunoda, Kikuo; and Kobayashi, Takehiro, to Ryobi Ltd. Ball arm control device for a spinning reel. 4,513,926, Cl. 242-84.20G.
Tsuzuki, Mitsuo: *See—*
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,514,742, Cl. 346-140.00R.
Tuong, Huynh-Ba; Kelly, Stephen M.; and Osman, Maged A., to Merck Patent Gesellschaft mit beschrankter Haftung. Anisotropic compounds and liquid crystal mixtures. 4,514,317, Cl. 252-299.620.
Turner, Michael J. B.: *See—*
Berry, Paul S.; Benson, John A.; Kettlewell, Peter J.; and Turner, Michael J. B., 4,513,689, Cl. 119-82.000.
Turner, William D.: *See—*
Johnson, Richard V.; and Turner, William D., 4,514,739, Cl. 346-108.000.
Tzvetanov, Plamen V.; Chankov, Dyanko V.; Nikolov, Orlin A.; and Ivanov, Alexander L., to N P K "Zavarachna Technika". Apparatus for the automatic welding of complex shapes. 4,513,902, Cl. 228-25.000.
UBE Industries, Ltd.: *See—*
Nakai, Mamoru; Iwata, Fumio; and Inoue, Teruhiko, 4,514,571, Cl. 546-306.000.
Udd, Soren, to AB Volvo. System for supplying combustion air to a supercharged internal combustion engine with charge air cooling. 4,513,729, Cl. 123-563.000.
Ueda, Shigeru: *See—*
Fukasawa, Yoshiharu; Matsumoto, Tatsuhiko; Kawai, Mituo; Ueda, Shigeru; Koizumi, Hideo; and Saitou, Hiroyuki, 4,514,234, Cl. 148-11.50P.
Ueda, Tomoyuki; and Ogawa, Hirotoshi. Valve assembly. 4,513,949, Cl. 251-266.000.
Ueno, Hideo: *See—*
Shinohara, Satoru; Fujii, Noboru; Imada, Kiyohisa; Kadota, Genichi; and Ueno, Hideo, 4,514,560, Cl. 536-1.100.
Ueno, Sadayasu: *See—*
Sato, Kanemasa; and Ueno, Sadayasu, 4,513,615, Cl. 73-204.000.
Uhl, Jurgen: *See—*
Irmscher, Klaus; and Uhl, Jurgen, 4,514,405, Cl. 514-46.000.
Ulics, George. Commode toilet tissue dispenser. 4,513,923, Cl. 242-55.200.
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., to Solex (U.K.) Limited. Air/fuel induction system for spark ignition internal combustion engines, and electromagnetic valves. 4,513,728, Cl. 123-527.000.
Umeha, Genkichi; and Hiraoka, Takeshi, to Nippon Piston Ring Co., Ltd. Steel floating seal with remelted deposit-alloyed wear surfaces. 4,513,977, Cl. 277-96.200.
Union Camp Corporation: *See—*
Peck, Michael C., 4,514,540, Cl. 524-514.000.
Union Carbide Corporation: *See—*
Barnabeo, Austin E., 4,514,545, Cl. 525-330.400.
D'Silva, Themistocles D. J., 4,514,392, Cl. 514-148.000.
Kulkarni, Ravi D.; Goddard, E. Desmond; and Aronson, Michael P., 4,514,319, Cl. 252-321.000.
Matulewicz, William N.; Mohr, Paul H.; and Matlock, Paul L., 4,514,315, Cl. 252-75.000.
Montgomery, Lionel C., 4,514,355, Cl. 264-332.000.
Nowobilski, Jeffert J.; and Owens, William J., 4,514,450, Cl. 428-120.000.
Union Oil Company of California: *See—*
Amend, William E., 4,513,947, Cl. 251-174.000.
Miller, Alex E., 4,514,379, Cl. 423-228.000.
Union Special Corporation: *See—*
Bhatia, Chandrakant; Toman, George M.; and Bock, Thomas J., 4,513,674, Cl. 112-220.000.
Unique Functional Products: *See—*
Law, Denny B.; and Goettker, Bernhardt P., 4,514,132, Cl. 414-537.000.
Uniroyal, Inc.: *See—*
Crepeau, Allen E., 4,514,442, Cl. 427-140.000.
Skura, William A., 4,514,179, Cl. 474-204.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Fuller, Peter W. W., 4,513,668, Cl. 102-511.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Edwards, Julian G.; and Roddie, Alan G., 4,514,624, Cl. 250-211.00R.
U.S. Clinical Products, Inc.: *See—*
Cummings, Robert, 4,514,248, Cl. 156-268.000.
United States Gypsum Company: *See—*
Wendt, Alan C., 4,513,549, Cl. 52-211.000.
Wendt, Alan C., 4,513,557, Cl. 52-735.000.
United States of America
Agriculture: *See—*
Dale, Jim E., 4,513,528, Cl. 47-1.500.
Air Force: *See—*
Azgapetian, Victor, deceased, 4,514,056, Cl. 350-372.000.
Berthel, Robert O.; Plank, Vernon G.; Jones, Stephen H.; and Matthews, Anthony J., 4,514,758, Cl. 358-93.000.
Army: *See—*
Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, 4,514,478, Cl. 429-196.000.
Cade, J. Weldon; and Stein, Stanley I., 4,514,135, Cl. 414-682.000.
Gutleber, Frank S., 4,514,853, Cl. 375-34.000.
Haynes, Kenton L.; Sherer, William P.; Greene, Hugh W.; Holder, James D.; and Roberts, Thomas G., 4,514,684, Cl. 324-120.000.
McDonnell, Michael M., 4,514,059, Cl. 350-162.160.
Miller, Walter E., Jr.; and McKelvy, James W., 4,514,690, Cl. 324-225.000.
Rose, Douglas N.; and Becker, John E., 4,513,807, Cl. 165-10.000.
Sayles, David C., 4,513,513, Cl. 34-1.000.
Segletes, Steven B., 4,513,666, Cl. 102-476.000.
Voigt, H. William; and Murphy, Francis X., 4,514,239, Cl. 149-18.000.
Voigt, H. William, 4,514,341, Cl. 260-467.000.
Young, Harvey R., 4,514,142, Cl. 416-1.000.
Energy: *See—*
Dubrin, James W., 4,514,363, Cl. 423-3.000.
Mientek, Anthony P., 4,514,475, Cl. 429-35.000.
Health and Human Services: *See—*
Barrett, Harrison H., 4,514,632, Cl. 250-368.000.
Braatz, James A.; McIntire, Kenneth R.; and Princler, Gerald L., 4,514,506, Cl. 436-518.000.
National Aeronautics and Space Administration: *See—*
Campbell, Thomas G., 4,514,143, Cl. 416-23.000.
Elliott, David G., 4,514,137, Cl. 415-1.000.
Heyman, Joseph S.; and Brandenburger, Gary H., 4,513,750, Cl. 128-660.000.
Lauver, Richard W., 4,514,557, Cl. 528-342.000.
Poorman, Richard M., 4,513,810, Cl. 165-61.000.
Stephens, James B.; Yang, Mary M.; and Laue, Eric G., 4,514,278, Cl. 204-430.000.
Navy: *See—*
Edmonds, David A., 4,513,664, Cl. 102-216.000.
Ferrante, Ronald A., 4,514,479, Cl. 430-2.000.
Hanson, Paul A.; and Walton, James M., 4,514,834, Cl. 367-141.000.
Wilger, John F.; Nakano, Gregory; and Berman, William A., 4,513,542, Cl. 51-241.00S.
U.S. Philips Corporation: *See—*
Eisemann, Kurt, 4,514,839, Cl. 369-270.000.
Nillesen, Antonius H. H. J.; and Welles, Petrus W. G., 4,514,754, Cl. 358-13.000.
Parmentier, Paul, 4,514,785, Cl. 361-401.000.
Piepers, Harry, 4,514,700, Cl. 330-56.000.
Susz, Dietfried, 4,514,773, Cl. 360-77.000.
van Dam, Jacobus I. M., 4,514,713, Cl. 336-96.000.
van der Zwart, Alfred J., 4,514,795, Cl. 363-27.000.
van Gompel, Henricus J., 4,514,762, Cl. 358-163.000.
van Ommen, Alfred H.; Maas, Henricus G. R.; Appels, Johannes A.; and Josquin, Wilhelmus J. M. J., 4,514,251, Cl. 156-628.000.
Van Rosmalen, Gerard E., 4,514,837, Cl. 369-219.000.
Zogg, Urs, 4,514,702, Cl. 330-254.000.
United States Steel Corporation: *See—*
DiNardo, Victor M., 4,514,534, Cl. 524-108.000.
United States Surgical Corp.: *See—*
Aranyi, Ernie; Ihasz, Richard; Gravener, Roy D.; and Tovey, Hugh J., 4,513,746, Cl. 128-334.00C.
United Technologies Corporation: *See—*
Deveau, Paul J.; Greenberg, Paul B.; and Paolillo, Roger E., 4,513,567, Cl. 60-39.020.
Giamei, Anthony F.; and Kear, Bernard H., 4,514,360, Cl. 420-454.000.
Loersch, Joseph F.; and Neal, James W., 4,514,469, Cl. 428-553.000.
Unitrode Corporation: *See—*
Van Dyk Soerewyn, Herman F., 4,514,587, Cl. 174-52.00H.
Universal Maschinenfabrik: *See—*
Lutz, Albert, 4,513,588, Cl. 66-126.00R.
University of Miami: *See—*
Fox, Sidney W.; and Przybylski, Aleksander T., 4,514,584, Cl. 136-263.000.
University of Utah: *See—*
Janata, Jiri, 4,514,263, Cl. 204-1.00T.
University of Waterloo: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,514,096, Cl. 374-27.000.
University Patents, Inc.: *See—*
Kaiser, Emil T.; and Moe, Gregory, 4,514,331, Cl. 260-112.50T.
Sievers, Robert E.; and Gillis, John N., 4,514,522, Cl. 521-53.000.
Uotila, Esko: *See—*
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, 4,514,816, Cl. 364-478.000.
Uphoff, Billie J., to Lawrence Brothers, Inc. Barn door framing system. 4,513,535, Cl. 49-409.000.
Uphoff, Billie J.: *See—*
Johnson, Larry; and Uphoff, Billie J., 4,513,554, Cl. 52-657.000.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr.; and Ludens, James H., 4,514,407, Cl. 514-220.000.
Urakawa, Tetsuro: *See—*
Inoue, Hiroshi; Komeya, Katsutoshi; Tsuge, Akihiko; Koide, Kazunari; Mori, Masaaki; and Urakawa, Tetsuro, 4,514,370, Cl. 423-344.000.
Uretsky, Yan S.; Kajumov, Rashid R.; Bashirov, Zaur A.; Bashirova, Alfia G.; and Strelnikov, Alexandr A., to Kazansky Aviatsionny

Institut Imeni A. N. Tupoleva. System for testing articles with random and harmonic vibrations. 4,513,620, Cl. 73-664.000.
Uretsky, Yan S., to Kazansky Aviatsionny Institut Imeni A. N. Tupoleva. Method of forming random vibration spectrum and device therefor. 4,513,622, Cl. 73-664.000.
Urmson, Charles C.: *See*—
Jalbert, Robert A.; Galcenski, Anthony P., Jr.; and Urmson, Charles C., 4,513,518, Cl. 36-44.000.
Urquhart, Kevin G. Camera mounting system. 4,514,068, Cl. 354-293.000.
Usher, George R., to Eagle Precision Tool Ltd. Apparatus and method for forming seamed tube. 4,513,596, Cl. 72-51.000.
Ushiyama, Hisayuki; Ochi, Hisayuki; Miyamae, Tatsuo; and Wakamiya, Katsutoshi, to Canon Kabushiki Kaisha. Developer for electrophotography having carrier particles, toner particles and electroconductive fine powders. 4,514,485, Cl. 430-106.600.
USM Corporation: *See*—
Price, Frank C., 4,513,886, Cl. 222-146.500.
Winter, William J., 4,514,161, Cl. 425-154.000.
Utvecklingsaktiebolaget Teccon: *See*—
Persbeck, Sven-Eric; and Almqvist, Bert, 4,513,830, Cl. 177-1.000.
Uwai, Toshihiro: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Matsuda, Kenji; Uwai, Toshihiro; and Hanari, Tohru, 4,514,513, Cl. 502-112.000.
Uyterhoeven, Jan; Jacobs, Pierre; Adriaensen, Ludo; and Geerts, Jan, to N.V. Bekaert S.A. Catalyst and method of its preparation. 4,514,520, Cl. 502-337.000.
Uzia R&D Associates: *See*—
Gal, Uzi, 4,513,523, Cl. 42-72.000.
Uzumaki, Mitsutaka: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Uzuo, Takeshi: *See*—
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, 4,514,395, Cl. 514-224.000.
Vadasz, Amnon F., to Intevep, S.A.; Vereinigte Edelstahlwerke A.G.; and Oficina Technica HGB. Check valve. 4,513,778, Cl. 137-533.110.
Valashinas, James W.: *See*—
Agnew, Palmer W.; Buonomo, Joseph P.; Houghtalen, Steven R.; Kellerman, Anne S.; Losinger, Raymond E.; and Valashinas, James W., 4,514,803, Cl. 364-200.000.
Valentine, Walter J., to Garbo, Paul W., a part interest. Electrical warning system for malfunctions in refrigeration. 4,514,724, Cl. 340-648.000.
Valmet Oy: *See*—
Koski, Erkki, 4,514,259, Cl. 162-343.000.
Vedenpaa, Timo, 4,513,517, Cl. 34-114.000.
Van Antwerp, Joel C., to TRW Inc. Automatic brightness control apparatus. 4,514,727, Cl. 340-793.000.
van Arragon, Gerrit W.: Mensink, Kornelis A.; and Wittkampf, Frederik H. M., to Vitatron Medical B.V. Physiological devices such as pacemakers and method for providing histogram data. 4,513,743, Cl. 128-419.0PG.
van Dam, Jacobus I. M., to U.S. Philips Corporation. Inductive ballast coated with an insulation layer and method of coating the ballast. 4,514,713, Cl. 336-96.000.
Vandekeybus, Christiaan A. C. Device for tying-up an animal. 4,513,693, Cl. 119-147.00R.
Vandelinde, Henry, to Swing Stage Limited. Drive mechanism for cable drums. 4,513,952, Cl. 254-285.000.
Vanderminden, Robert D.; and Parker, Paul, to Telescope Folding Furniture Co. Inc., The. Collapsible lounge chair. 4,514,009, Cl. 297-27.000.
van der Zwart, Alfred J., to U.S. Philips Corporation. High-voltage generator, notably for an X-ray tube. 4,514,795, Cl. 363-27.000.
Van Deursen, Gary E., to Black & Decker, Inc. Hair roller clip. 4,513,761, Cl. 132-41.000.
Van Dyk Soerewyn, Herman F., to Unitrode Corporation. High power semiconductor package. 4,514,587, Cl. 174-52.00H.
van Es, Antonie F.: *See*—
Frijters, Petrus J. G.; and van Es, Antonie F., 4,513,685, Cl. 119-1.000.
van Gompel, Henricus J., to U.S. Philips Corporation. Video signal multiplying circuit. 4,514,762, Cl. 358-163.000.
Van Husen, Hendrik W., to GTE Automatic Electric Incorporated. Hall effect device test circuit. 4,514,687, Cl. 324-158.00R.
Van Leirsburg, Dean A.: *See*—
Hubred, Gale L.; and Van Leirsburg, Dean A., 4,514,369, Cl. 423-54.000.
Van Loveren, Augustinus G.: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,514,324, Cl. 252-522.00R.
van Ommen, Alfred H.; Maas, Henricus G. R.; Appels, Johannes A.; and Josquin, Wilhelmus J. M. J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device, in which patterns are formed in a layer of silicon nitride by means of ion implantation. 4,514,251, Cl. 156-628.000.
Van Ouwerkerk, Anton: *See*—
Evers, William J.; Mookherjee, Braja D.; Van Ouwerkerk, Anton; and Van Loveren, Augustinus G., 4,514,324, Cl. 252-522.00R.
Van Rosmalen, Gerard E., to U.S. Philips Corporation. Apparatus for optically reading and/or recording information. 4,514,837, Cl. 369-219.000.
van Santen, Aart: *See*—
Borrman, Bo; Hellman, Erik; Ode, Bengt; and van Santen, Aart, 4,514,358, Cl. 376-362.000.
Van Scoyk, Pershing R.: *See*—
Welton, Charles L.; and Van Scoyk, Pershing R., 4,513,561, Cl. 54-83.00R.
van Zon, Cornelis; Jonkeren, Gerrit J.; and Eggengoor, Hilbert, to Wafilin B.V. Non-woven tube for membrane filtration. 4,514,302, Cl. 210-433.200.
Varian Associates, Inc.: *See*—
Gerard, William A., 4,514,689, Cl. 324-208.000.
Varlemann, Kurt. Automatic hydraulic reversing valve for a double-action working cylinder. 4,513,653, Cl. 91-239.000.
Varwig, Juergen: *See*—
Hamprecht, Gerhard; Varwig, Juergen; and Rohr, Wolfgang, 4,514,572, Cl. 549-246.000.
Vasers, Margita L.: *See*—
Gaffar, Abdul; Davis, Calvin B.; and Vasers, Margita L., 4,514,382, Cl. 424-54.000.
VEB Kombinat Feinmechanische Werke Halle: *See*—
Roselt, Udo; Nolte, Lothar; and Pohler, Manfred, 4,514,206, Cl. 65-108.000.
Vedenpaa, Timo, to Valmet Oy. Cylinder dryer for paper machine or equivalent. 4,513,517, Cl. 34-114.000.
Veit, Dagmar V., to Prodes, S.A. Process for obtaining complex of 3-methoxy-N-methylmorphinan with 7-theophyllineacetic acid (1:2). 4,514,404, Cl. 514-265.000.
Vercon Inc.: *See*—
MacLaughlin, Donald N.; and Fortuna, Vincent E., 4,514,242, Cl. 156-73.500.
Vercruysse, Oscar D., to General Motors Corporation. Die engaging block for a die change truck. 4,514,133, Cl. 414-512.000.
Vereinigte Edelstahlwerke A.G.: *See*—
Vadasz, Amnon F., 4,513,778, Cl. 137-533.110.
Vereinigte Flugtechnische Werke: *See*—
Schmidtlein, Hubertus; and Lerche, Horst-Dieter, 4,514,733, Cl. 343-5.0MM.
Verma, Surendra K.; and Kim, George A., to RCA Corporation. Silicon oxide lapping coatings. 4,514,192, Cl. 51-295.000.
VerMehren, H. Richard. Method of affixing envelopes and letterheads to a carrier sheet and assembly formed thereby. 4,514,182, Cl. 493-216.000.
Vescial, Frederick, to Rockwell International Corporation. Ring laser gyroscope readout for partially overlapping beams. 4,514,087, Cl. 356-350.000.
Vescial, Frederick, to Rockwell International Corporation. Single mirror ring laser gyro readout without combining optics. 4,514,832, Cl. 356-350.000.
Vetere, Alessandro: *See*—
Gazzi, Luigi; Cotone, Giancarlo; Soldati, Gianfraco; Ginnasi, Alessandro; Vetere, Alessandro; and Rescalli, Carlo, 4,514,203, Cl. 62-17.000.
Veverka, Edward F., to McGraw-Edison Company. Disconnect switch assembly. 4,514,606, Cl. 200-146.00R.
Victor Company of Japan, Ltd.: *See*—
Tokuyama, Yoshio, 4,514,668, Cl. 318-294.000.
Victor Technologies Inc.: *See*—
Stark, Glenn; and Barton, David M., 4,514,771, Cl. 360-73.000.
Vieland, Leon J., to RCA Corporation. Electron beam injection structure for flat panel display devices. 4,514,663, Cl. 315-366.000.
Vincent De Araujo, Manuel A. Fuse. 4,514,716, Cl. 337-281.000.
Vitatron Medical B.V.: *See*—
van Arragon, Gerrit W.; Mensink, Kornelis A.; and Wittkampf, Frederik H. M., 4,513,743, Cl. 128-419.0PG.
Voest-Alpine Aktiengesellschaft: *See*—
Augustin, Hubert; and Pirker, Robert, 4,514,235, Cl. 148-37.000.
Vogeleer, John P., to Westinghouse Electric Corp. Measuring of tube expansion. 4,513,506, Cl. 33-147.00K.
Voigt, H. William; and Murphy, Francis X., to United States of America, Army. Production of fine crystalline TNT compositions. 4,514,239, Cl. 149-18.000.
Voigt, H. William, to United States of America, Army. Storage stable nitroglycerin. 4,514,341, Cl. 260-467.000.
Voirin, Jean-Philippe: *See*—
Pon, Francois; Voirin, Jean-Philippe; and Lucan, Andre, 4,514,484, Cl. 430-106.600.
Vollman, Leonard L., to Scale Free Systems, Inc. Apparatus for stimulating removal of electrolytic energy from fluids. 4,514,273, Cl. 204-196.000.
Vossenkemper, Earl H. Tire chain mounting device. 4,513,800, Cl. 152-213.00A.
Vrouenraets, Cornelius M. F., to Akzo nv. Packaging film permeable to smoke constituents and packaged smoked foodstuff. 4,514,472, Cl. 428-220.000.
Vuceta, Ivan N.: *See*—
Grabovac, Bosko; and Vuceta, Ivan N., 4,513,645, Cl. 81-57.390.
Vyse, Brian: *See*—
Maxwell, John W.; and Vyse, Brian, 4,514,255, Cl. 162-9.000.
W. R. Grace & Co., Cryovac Div.: *See*—
Schoenberg, Julian H., 4,514,465, Cl. 428-339.000.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Lossl, Gunter; Zauhar, Helmut; and Stock, Horst, 4,513,544, Cl. 51-283.00R.

Wada, Hidemi: *See*—
Iguchi, Katsuhiko; Wada, Hidemi; and Wakita, Ryuichi, 4,514,348, Cl. 264-40.100.

Wada, Kenichi; Oka, Tateki; and Tabuchi, Kenji, to Minolta Camera Kabushiki Kaisha. Method of controlling toner concentration for electrophotographic copying apparatus. 4,514,480, Cl. 430-30.000.

Wade, William L., Jr.: *See*—
Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, 4,514,478, Cl. 429-196.000.

Wadhwa, Suresh K., to Hughes Tool Company. Cross-linking system for water based well fracturing fluids. 4,514,309, Cl. 252-8.55R.

Wafilin B.V.: *See*—
van Zon, Cornelis; Jonkeren, Gerrit J.; and Eggengoor, Hilbert, 4,514,302, Cl. 210-433.200.

Waggoner, John, to Enthone, Inc. Method of using a shielding means to attenuate electromagnetic radiation in the radio frequency range. 4,514,586, Cl. 174-35.0MS.

Wagner, Paul-Heinz: *See*—
Dubiel, Oswald, 4,513,827, Cl. 173-12.000.

Wahl Clipper Corporation: *See*—
Thurber, Robert J., 4,513,736, Cl. 128-41.000.

Wahlstrom, Bjorn: *See*—
Ollus, Martin; Uotila, Esko; Wahlstrom, Bjorn; Saukkonen, Esko; Malinen, Pekka; and Maenpaa , Immo, 4,514,816, Cl. 364-478.000.

Wairegi, Tom; Boyle, Joseph P.; and Gilbert, John B., to Exxon Research and Engineering Co. Reactivation of iridium-containing catalysts. 4,514,284, Cl. 208-140.000.

Waite, Thomas R.: *See*—
Holmes, Dale A.; and Waite, Thomas R., 4,514,850, Cl. 372-95.000.

Wakabayashi, Hajimu; Terai, Ryohei; Yamanaka, Hiroshi; and Hara, Shigeo, to Agency of Industrial Science & Technology. Process for vitrifying liquid radioactive waste. 4,514,329, Cl. 252-629.000.

Wakamiya, Katsutoshi: *See*—
Ushiyama, Hisayuki; Ochi, Hisayuki; Miyamae, Tatsuo; and Wakamiya, Katsutoshi, 4,514,485, Cl. 430-106.600.

Wakeman, Thomas G.: *See*—
Hauser, Ambrose A.; Hetico, Rolf R.; and Wakeman, Thomas G., 4,513,975, Cl. 277-22.000.

Wakita, Ryuichi: *See*—
Iguchi, Katsuhiko; Wada, Hidemi; and Wakita, Ryuichi, 4,514,348, Cl. 264-40.100.

Waldes Kohinoor, Inc.: *See*—
Coch, Lester; and Rauch, Kurt, 4,514,093, Cl. 366-138.000.

Waldron, Curtis R. Animal mugger. 4,513,690, Cl. 119-99.000.

Walker, Charles W., Jr.: *See*—
Binder, Michael; Petersen, Eric R.; Walker, Charles W., Jr.; Wade, William L., Jr.; and Gilman, Sol, 4,514,478, Cl. 429-196.000.

Walker, Ian C., to Quantel Limited. Video image creation system which simulates drafting tool. 4,514,818, Cl. 364-521.000.

Wall, George W.; and Jones, Glyn T., to English Clays Lovering Pochin & Company, Ltd. Tube pressure filter. 4,514,298, Cl. 210-232.000.

Wallace, John L., to Maintel Pty. Limited. Excavatory machine for use in coal and other mining opertions. 4,514,012, Cl. 299-57.000.

Wallach, Steven J.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Wallach, Walter A., Jr.: *See*—
Gruner, Ronald H.; Clancy, Gerald F.; Mundie, Craig J.; Wallach, Steven J.; Schleimer, Stephen I.; Wallach, Walter A., Jr.; Ahlstrom, John K.; Bernstein, David H.; Richmond, Michael S.; Farber, David A.; Pilat, John F.; Belgard, Richard A.; and Bratt, Richard G., 4,514,800, Cl. 364-200.000.

Wallstein, Dieter, to Langbein & Engelbracht GmbH & Co. KG. Glass pipe heat exchanger. 4,513,814, Cl. 165-134.00R.

Waltemate, Dieter: *See*—
Sundermeier, Gunter; and Waltemate, Dieter, 4,514,021, Cl. 312-291.000.

Walter, Lothar; and Reith, Walter, to SKF Kugellagerfabriken GmbH. Rolling bearing for lengthwise movement. 4,514,017, Cl. 308-6.00C.

Walton, James M.: *See*—
Hanson, Paul A.; and Walton, James M., 4,514,834, Cl. 367-141.000.

Walton, John M., to Bridon Limited. Transmission cable with helical support elements of curvilinear profile. 4,514,058, Cl. 350-96.230.

Wandel & Goltermann GmbH & Co. KG: *See*—
Harzer, Peter, 4,514,705, Cl. 331-2.000.

Wang, An; and McConchie, Burton G., to Wang Laboratories, Inc. Scanner document positioning device. 4,514,063, Cl. 353-28.000.

Wang, Cheng-hua, to Centronics Data Computer Corp. Method of making a print pin actuator. 4,513,496, Cl. 29-606.000.

Wang Laboratories, Inc.: *See*—
Wang, An; and McConchie, Burton G., 4,514,063, Cl. 353-28.000.

Wang, Sophia; Roof, Glenn L.; and Porlier, Beth W., to Nalco Chemical Company. Fuel sweetening with organic peroxides. 4,514,286, Cl. 208-196.000.

Ward, Carmen: *See*—
Ward, Mai; and Ward, Carmen, 4,513,525, Cl. 43-55.000.

Ward, Mai; and Ward, Carmen. Fishing bucket. 4,513,525, Cl. 43-55.000.

Ward, Phillip B., Jr.: *See*—
Palmer, John P.; and Ward, Phillip B., Jr., 4,514,057, Cl. 350-96.150.

Ware, Ray L. Inertial valve apparatus. 4,513,763, Cl. 137-38.000.

Warner-Lambert Company: *See*—
Yang, Robert; and Rieger, Martin M., 4,514,422, Cl. 426-3.000.

Warner, Michael V., to Rumble Equipment Limited. Safety mounting device. 4,514,616, Cl. 219-136.000.

Warner & Swasey Company, The: *See*—
Silverman, Martin L., 4,513,979, Cl. 279-4.000.

Washburn, Hudson A., to Intel Corporation. Method for selecting propagation elements for magnetic bubble memory. 4,514,827, Cl. 365-1.000.

Watabe, Takaharu, to Santo Industries Co., Ltd. Wedge hinge having an axially movable pivot. 4,513,474, Cl. 16-243.000.

Watanabe, Hiroyuki; and Tanaka, Yasushi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle body floor construction of motor vehicle. 4,514,008, Cl. 296-204.000.

Watanabe, Masazumi: *See*—
Imada, Isuke; and Watanabe, Masazumi, 4,514,420, Cl. 514-689.000.

Watt, Allan E. Air cooled ice rink construction. 4,513,583, Cl. 62-235.000.

Waxman, Monroe H.: *See*—
Closmann, Philip J.; Waxman, Monroe H.; and Deeds, Charles T., 4,514,283, Cl. 208-86.000.

Waymatic, Inc.: *See*—
Wright, Clem B., 4,513,984, Cl. 280-43.230.

Webb, Richard, to Misty Vapor, Inc. Fuel saving system for a gasoline engine. 4,513,726, Cl. 123-523.000.

Wegner, John W.: *See*—
Coker, Melvin D.; and Wegner, John W., 4,513,788, Cl. 138-89.000.

Wehr Corporation: *See*—
Schneider, Steven L.; and Dravnieks, Konstantins, 4,513,809, Cl. 165-54.000.

Weigle, Dieter: *See*—
Steprath, Werner; and Weigle, Dieter, 4,513,826, Cl. 172-7.000.

Weinberg, Roger A., to Baker Oil Tools, Inc. Casing bore receptacle. 4,513,817, Cl. 166-138.000.

Weinstock, Joseph: *See*—
Chambers, Pamela A.; and Weinstock, Joseph, 4,514,394, Cl. 514-213.000.

Weiss, Joern-Volker: *See*—
Riemer, Heinz; Weiss, Joern-Volker; and Mutzberg, Friedhelm, 4,514,467, Cl. 428-413.000.

Welles, Petrus W. G.: *See*—
Nillesen, Antonius H. H. J.; and Welles, Petrus W. G., 4,514,754, Cl. 358-13.000.

Wells, James E., to Air Products and Chemicals, Inc. Process for preparing triethylenediamine. 4,514,567, Cl. 544-352.000.

Wells, R. Leon. Height adjustment mechanism. 4,513,472, Cl. 15-354.000.

Welton, Charles L.; and Van Scoyk, Pershing R. Flexible spur holders and spurs. 4,513,561, Cl. 54-83.00R.

Wendt, Alan C., to United States Gypsum Company. Pre-mitered doorframe assembly for partition wall construction. 4,513,549, Cl. 52-211.000.

Wendt, Alan C., to United States Gypsum Company. Clip for use with runner and runner assembly including the clip. 4,513,557, Cl. 52-735.000.

Wenger, Georg: *See*—
Gmeinder, Hermann; and Wenger, Georg, 4,514,604, Cl. 200-83.00N.

Wenk, Paul; Breitenstein, Werner; and Baumann, Marcus, to Ciba Geigy Corporation. Benzofuran-2(3H)-ones used as anti-inflammatory agents. 4,514,415, Cl. 514-470.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Kotthaus, Erich, 4,514,118, Cl. 409-26.000.

Wermuth, Camille G.; Biziere, Kathleen; and Davi, Horace, to Sanofi. Derivatives of 4-methyl 6-phenyl pyridazine active on the central nervous system. 4,514,397, Cl. 514-247.000.

Werner, Hans: *See*—
Neubauer, Wilhelm; and Werner, Hans, 4,514,090, Cl. 366-91.000.

Werner and Pfleiderer: *See*—
Neubauer, Wilhelm; and Werner, Hans, 4,514,090, Cl. 366-91.000.

Wesemeyer, Jurgen: *See*—
Fassel, Reinhard; Meier, Werner; Rauch, Hans; Wesemeyer, Jurgen; and Raddant, Hans-Joachim, 4,514,670, Cl. 318-467.000.

West Electric Company, Ltd.: *See*—
Makino, Hiroshi; Higuchi, Masaru; and Murata, Kazuou, 4,514,084, Cl. 356-4.000.

Westdale, Virgil W.; Hanrahan, James L.; and Anderson, William C., to AM International, Inc. Magnetic toner developing device. 4,514,077, Cl. 355-3.0DD.

Westfalia Separator AG: *See*—
Kohlstette, Werner, 4,514,183, Cl. 494-27.000.

Westinghouse Electric Corp.: *See*—
Brooker, Lenon G., 4,514,462, Cl. 428-285.000.
Stol, Israel, 4,514,614, Cl. 219-125.110.
Vogeleer, John P., 4,513,506, Cl. 33-147.00K.
York, Theodore H., 4,514,697, Cl. 329-104.000.

Westlake, Betsy C., to Kendall Company, The. Therapeutic stocking and method of placement. 4,513,740, Cl. 128-165.000.

Westling, Wayne A. Ocean powered pump. 4,514,644, Cl. 290-53.000.

Westvaco Corporation: *See*—
Du Vernet, Richard B., 4,514,335, Cl. 260-400.000.

Weterings, Cornelis A. M.; and Janssen, Johannes A., to Stamicarbon B.V. Process for recovering a uranium-containing concentrate and purified phosphoric acid from a wet process phosphoric acid containing uranium. 4,514,365, Cl. 423-15.000.

Wevelsiep, Klaus; and Kastner, Anton, to Scantron GmbH & Co. Method and apparatus for identification of objects. 4,514,622, Cl. 235-463.000.

Weyant, Robert R., to Pacesetter Systems, Inc. Bipolar sensing system. 4,513,752, Cl. 128-696.000.

Weyer, Paul P. Fluid powered torque wrench. 4,513,644, Cl. 81-57.390.

Weyerhaeuser Company: *See*—
Grosshuesch, Lee V., 4,513,907, Cl. 229-23.00R.

Wheeler, Edward S., to Interpace Corporation. Glaze to pin connection for a high voltage direct current insulator with embedded metal fitting. 4,514,591, Cl. 174-182.000.

Wheeler, William J., to Eli Lilly and Company. 7β-(2'-(1",3",5"-Triazepin-4"-one)-2'-(oxime ether)-acetamido)-3-substituted cephalosporins. 4,514,564, Cl. 544-25.000.

Whetstone, Albert L., to Summagraphics Corporation. Digital tablet system with calibration means. 4,514,688, Cl. 324-208.000.

Whetstone, Albert L.; Shaklee, Kerry L.; and Modjallal, Khosrow, to Display Interface Corporation. Noise mouse. 4,514,726, Cl. 340-710.000.

Whitaker, Gene C., to Whitlog, Inc. Self-contained lifting apparatus for low-boy trailers. 4,513,987, Cl. 280-423.00B.

White, Arthur C.: *See*—
Kohler, Richard B.; and White, Arthur C., 4,514,509, Cl. 436-518.000.

White, Thomas C. Intraocular lens. 4,513,456, Cl. 3-13.000.

Whitley, George J.; and Rayl, Martin, to RCA Corporation. Component lead processing device. 4,513,493, Cl. 29-566.300.

Whitlog, Inc.: *See*—
Whitaker, Gene C., 4,513,987, Cl. 280-423.00B.

Wicke, Charles A.; and Riley, Wayne C., to Emerson Electric Co. Instant hot water dispenser. 4,513,887, Cl. 222-146.500.

Wicklund, Dale L. Animal trap. 4,513,527, Cl. 43-87.000.

Wickstrom, Sven: *See*—
Lindblom, Thore; Hedin, Jan-Erik; and Wickstrom, Sven, 4,513,799, Cl. 144-379.000.

Widdall, John A., to British Aerospace Public Limited Company. Testing the balance of a rotatable member. 4,513,619, Cl. 73-455.000.

Wiemer, Willem. Vertical radiation tank. 4,513,694, Cl. 122-7.00R.

Wiklund, Thomas: *See*—
Swiatkowski, Piotr; and Wiklund, Thomas, 4,514,290, Cl. 209-166.000.

Wilger, John F.; Nakano, Gregory; and Berman, William A., to United States of America, Navy. Portable surfacing machine for boiler manhole. 4,513,542, Cl. 51-241.00S.

Wilkinson, John S., to Therm-O-Type Corporation. Methods and apparatus for neutralizing a static electrical charge on powder particles. 4,514,779, Cl. 361-213.000.

Will, Elmar. Rechargeable power pack and a pocket lamp for use therewith. 4,514,790, Cl. 362-183.000.

William H. Rorer, Inc.: *See*—
Campbell, Henry F., 4,514,400, Cl. 514-252.000.

Wm. Neundorfer & Co., Inc : *See*—
Brussee, Richard C.; and Dowd, Robert E., Jr., 4,514,780, Cl. 361-226.000.

Williams, Earl P.; and Wood, Lindley S., to GAF Corporation. Stable dispersion of alkylated polyvinylpyrrolidone and vinyl pyrrolidone. 4,514,271, Cl. 204-159.150.

Williams, Frederick J.: *See*—
Knight, Lindsay C.; Cash, David A.; Stewart, Duncan; Cottis, Robert A.; Bowyer, William H.; Newnham, Robert C.; Williams, Frederick J.; and Pardon, David W., 4,514,621, Cl. 235-400.000.

Williams, John T.; and August, Melvin C., to Cray Research, Inc. Interconnected multiple circuit module. 4,514,784, Cl. 361-386.000.

Williams, Richard W.: *See*—
Johnson, David E.; and Williams, Richard W., 4,514,692, Cl. 324-329.000.

Wilson, Neill R.; and Wilson, Susan E. Evaporator and method of operation. 4,513,577, Cl. 62-91.000.

Wilson, Norman H. Lock arrangement. 4,513,593, Cl. 70-114.000.

Wilson, Richard A.: *See*—
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,094, Cl. 366-160.000.
Buckholz, Lawrence, Jr.; Wilson, Richard A.; and Kleinberg, Roger, 4,514,431, Cl. 426-641.000.

Wilson, Susan E.: *See*—
Wilson, Neill R.; and Wilson, Susan E., 4,513,577, Cl. 62-91.000.

Wilson, Thomas D.: *See*—
Schlesinger, Sheldon I.; Cerenzia, Walter S.; and Wilson, Thomas D., 4,514,354, Cl. 264-324.000.

Windibank, Brian P.: *See*—
Passmore, David T.; and Windibank, Brian P., 4,514,230, Cl. 106-243.000.

Windmere Corporation: *See*—
Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, 4,513,735, Cl. 128-24.200.

Winter, William J., to USM Corporation. Hydraulic roll protection system. 4,514,161, Cl. 425-154.000.

Winternitz, Paul: *See*—
Luthy, Christoph; and Winternitz, Paul, 4,514,566, Cl. 544-56.000.

Winthrop, John T., to American Optical Corporation. Progressive power ophthalmic lenses. 4,514,061, Cl. 351-169.000.

Wisconsin Gas Company: *See*—
Chen, Keith A., 4,513,776, Cl. 137-498.000.

Wise, Thomas J.; and Garratt, John N., to Goodall Rubber Company. Safety guides for use with a rotary hose and kelly spinner hoses and the combination thereof. 4,514,103, Cl. 138-106.000.

Wissinger, Waldemar: *See*—
Budich, Wolfgang; Gasper, Bertram; Kurth, Josef; Scharf, Karl-Gunter; and Wissinger, Waldemar, 4,514,449, Cl. 428-76.000.

Wisskirchen, Klaus B.: *See*—
Fricke, Reinhard L.; Hinze, Klaus; Huth, Manfred K. O.; and Wisskirchen, Klaus B., 4,514,609, Cl. 200-159.00A.

Wissler, Josef H., to Max-Planck-Gesellschaft zur Forderung der Wissenschaften. Chemokinesins and chemotaxins of leukocytes and inflamed tissues. 4,514,387, Cl. 424-85.000.

Witco Chemical Corporation: *See*—
Root, Jon C.; Barnes, John F.; and Coovert, Jack E., 4,514,312, Cl. 252-32.500.

Witte, Fritz, to Womako Maschinenkonstruktionen GmbH. Wire forming machine. 4,513,794, Cl. 140-105.000.

Witte, Kenneth G.; and Johnston, Thomas F., Jr., to Coherent, Inc. Dye laser with rotating wedge alignment servo. 4,514,849, Cl. 372-29.000.

Witte, Klaus J.; Fill, Ernst; and Scrlac, Walter, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Method and apparatus for the production of pre-pulse-free, smooth laser radiation pulses of variable pulse duration. 4,514,848, Cl. 372-25.000.

Wittkampf, Frederik H. M.: *See*—
van Arragon, Gerrit W.; Mensink, Kornelis A.; and Wittkampf, Frederik H. M., 4,513,743, Cl. 128-419.0PG.

Wnuk, Andrew J.: *See*—
Johnson, Bruce A.; and Wnuk, Andrew J., 4,514,345, Cl. 264-22.000.

Wochnowski, Waldemar; Hohm, Reinhard; Liebe, Reinhard; and Muss, Manfred, to Hauni-Werke Korber & Co. KG. Apparatus for expelling moisture from tobacco or the like. 4,513,759, Cl. 131-303.000.

Woelfel, James A.; and Smith, Richard W., to Motor Wheel Corporation. Fiber-reinforced composite wheel construction. 4,514,013, Cl. 301-63.0PW.

Wolf, Franz J.: *See*—
Klaschka, Rudolf; and Wolf, Franz J., 4,514,788, Cl. 361-433.000.

Wolfe, Saul; and Shaw, Chia-Cheng, to Queen's University at Kingston. Intermediates for process for 1-oxacephem derivatives. 4,514,333, Cl. 260-239.00A.

Wolff, Siegfried: *See*—
Kerner, Dieter; Kleinschmit, Peter; Parkhouse, Alan; and Wolff, Siegfried, 4,514,231, Cl. 106-309.000.

Wolters, Martin; and Meuer, Gerd R., to Maschinenfabrik Ernst Thielenhaus GmbH. Method of and apparatus for the superfinishing of a thin-wall metal workpiece. 4,513,538, Cl. 51-131.300.

Womako Maschinenkonstruktionen GmbH: *See*—
Witte, Fritz, 4,513,794, Cl. 140-105.000.

Woo, Yen-Kong. Fragrance impregnated fabric. 4,514,461, Cl. 428-240.000.

Wood, Charles D.: *See*—
Dibrell, Edwin W.; and Wood, Charles D., 4,513,576, Cl. 62-87.000.

Wood, Charles F. Gear box assembly. 4,514,145, Cl. 416-170.00R.

Wood, Kenneth E. Animal pens. 4,513,691, Cl. 119-99.000.

Wood, Lindley S.: *See*—
Williams, Earl P.; and Wood, Lindley S., 4,514,271, Cl. 204-159.150.

Woodard, Kenneth E., Jr.; and Dotson, Ronald L., to Olin Corporation. Method to reduce electrical contact resistance between contact surfaces in an electrode. 4,513,904, Cl. 228-116.000.

Worstell, Bernard W.: *See*—
Sarver, Glen E.; and Worstell, Bernard W., 4,513,768, Cl. 137-142.000.

Woyke, John F. Method and apparatus for absorption refrigeration. 4,513,584, Cl. 62-235.100.

Wray, Thomas E.: *See*—
Engel, Peter A.; Strope, Douglas H.; and Wray, Thomas E., 4,514,752, Cl. 357-72.000.

Wright, Clem B., to Waymatic, Inc. Wheel gear for trailers. 4,513,984, Cl. 280-43.230.

Wright, Dolph D., to General Motors Corporation. Pressure compensated flow control valve assembly for fluids containing finely divided solids. 4,513,777, Cl. 137-501.000.

Wrobel, Guenter: *See*—
Papst, Georg; Wrobel, Guenter; and Koletzki, Ulrich, 4,513,812, Cl. 165-80.00B.

Wyndham, Ronald, to Toth Aluminum Corporation. Purification of aluminum chloride. 4,514,373, Cl. 423-495.000.

Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., to University of Waterloo. Furnace wall ash deposit fluent phase change monitoring system. 4,514,096, Cl. 374-27.000.

Xerox Corporation: *See*—
Federico, Anthony M.; Legg, Ernest L.; and Nguyen, Tuan A., 4,514,846, Cl. 371-16.000.
Johnson, Richard V.; and Turner, William D., 4,514,739, Cl. 346-108.000.
Loutfy, Rafik O.; and Hsiao, Cheng-Kuo, 4,514,482, Cl. 430-78.000.
Smith, Henry E., 4,514,101, Cl. 400-59.000.

Yaegashi, Takashi: *See*—
Fujii, Setsuro; Yaegashi, Takashi; Nakayama, Toyoo; Sakurai, Yojiro; Nunomura, Shigeki; and Okutome, Toshiyuki, 4,514,416, Cl. 549-442.000.

Yajima, Toshio, to NHK Spring Co., Ltd. Motion snubbing device. 4,513,846, Cl. 188-380.000.

Yale Materials Handling Corporation: *See*—
Nieminski, Robert A.; and Hinde, Walter R., 4,513,839, Cl. 180-253.000.

Yamada, Seiji: *See*—
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,514,445, Cl. 427-410.000.
Yamagishi, Takeshi, to Yasui Sangyo Co., Ltd. Garage jack for lifting an automobile. 4,513,950, Cl. 254-8.00B.
Yamaguchi, Hirotsugu: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,513,835, Cl. 180-142.000.
Yamaguchi, Masaharu, to Iwao Jiki Kogyo Kabushiki Kaisha. Tile holding device for presetting tiles. 4,513,941, Cl. 249-91.000.
Yamaguchi, Nobuyuki, to Daiwa Seiko Co., Ltd. Drag brake device for spinning reel. 4,513,925, Cl. 242-84.50A.
Yamaguchi, Shinji: *See*—
Nakagawa, Junyo; Yamaguchi, Shinji; Hirakawa, Kiyoshi; Tokunaga, Isao; and Ito, Masaaki, 4,514,459, Cl. 428-229.000.
Yamaguchi, Tamikazu, to Minolta Camera Kabushiki Kaisha. High speed objective lens system with an aspheric surface. 4,514,052, Cl. 350-466.000.
Yamaguchi, Teruhito: *See*—
Tahara, Yoshiyuki; Komatsu, Yasuhiro; Koyama, Hiroyasu; Kubota, Reiko; Yamaguchi, Teruhito; and Takahashi, Toshihiro, 4,514,573, Cl. 564-387.000.
Yamaguchi, Toshiyuki: *See*—
Takenaka, Akihiko; Arakawa, Miyao; Sato, Masahiro; and Yamaguchi, Toshiyuki, 4,513,609, Cl. 73-116.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Hayashida, Takanori, 4,513,700, Cl. 123-179.00L.
Minami, Shunji; and Kimura, Hiroshi, 4,513,725, Cl. 123-511.000.
Yamahira, Yoshiya; Shima, Katsuhiko; Matsusaka, Chikako; and Noguchi, Tetsuo, to Sumitomo Chemical Company, Limited. Cream Preparation. 4,514,386, Cl. 424-81.000.
Yamakawa, Goichi: *See*—
Kasuya, Takahira; Morita, Hideaki; Takagiwa, Hiroyuki; and Yamakawa, Goichi, 4,514,487, Cl. 430-137.000.
Yamamoto, Jun: *See*—
Muramatsu, Shigeru; Fujiwara, Yuji; Hayashida, Hazime; and Yamamoto, Jun, 4,513,652, Cl. 84-20.000.
Yamamoto, Mutsuhiro: *See*—
Kikuchi, Junzo; Sugiura, Ryuzo; Yamamoto, Mutsuhiro; and Yoshida, Toshiro, 4,514,597, Cl. 179-99.00M.
Yamana, Noriaki: *See*—
Kaneko, Fumihiko; Murakawa, Tetsuya; Nitta, Koichi; Yamana, Noriaki; Takeda, Masashi; and Tachi, Kunio, 4,514,787, Cl. 361-420.000.
Yamanaka, Hiroshi: *See*—
Wakabayashi, Hajimu; Terai, Ryohei; Yamanaka, Hiroshi; and Hara, Shigeo, 4,514,329, Cl. 252-629.000.
Yamashita, Nobuyuki: *See*—
Hayashi, Tetsuaki; Kabu, Masahiro; and Yamashita, Nobuyuki, 4,513,834, Cl. 180-70.100.
Yamatsu, Kiyomi: *See*—
Hirose, Noriyasu; Kuriyama, Shizuo; Yamatsu, Kiyomi; Kitahara, Akifumi; and Uzuo, Takeshi, 4,514,395, Cl. 514-224.000.
Yamauchi, Aizo: *See*—
Asami, Tadao; Suehiro, Tetsuro; Ichijo, Hisao; Yamauchi, Aizo; Ogawa, Shigeo; Suzuki, Mitsuo; and Uzumaki, Mitsutaka, 4,514,367, Cl. 423-21.500.
Yanagawa, Hitoshi: *See*—
Tanaka, Kano; Ando, Yoshio; and Yanagawa, Hitoshi, 4,514,641, Cl. 250-570.000.
Yanagihashi, Kikuji: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,514,156, Cl. 418-173.000.
Yanagishima, Takayuki; and Kasai, Junichi, to Nissan Motor Company, Limited. Speaker for automotive vehicle audio system having a vehicle panel serving as sound-amplifying medium. 4,514,599, Cl. 179-181.00W.
Yanai, Tokiyoshi: *See*—
Fukino, Masato; Yanai, Tokiyoshi; Yamaguchi, Hirotsugu; and Aoyama, Yutaka, 4,513,835, Cl. 180-142.000.
Yang, Mary M.: *See*—
Stephens, James B.; Yang, Mary M.; and Laue, Eric G., 4,514,278, Cl. 204-430.000.
Yang, Robert; and Rieger, Martin M., to Warner-Lambert Company. Non-staling gum composition and method of preparation. 4,514,422, Cl. 426-3.000.
Yang, Yung-hsiung: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,514,401, Cl. 514-253.000.
Yasui, Kazuomi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; and Shiokawa, Kozo, 4,514,210, Cl. 71-92.000.
Yasui Sangyo Co., Ltd.: *See*—
Yamagishi, Takeshi, 4,513,950, Cl. 254-8.00B.
Yasui, Yoshiharu: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; Seiki, Kazuo; and Takasu, Shigeru, 4,513,481, Cl. 19-244.000.
Yatsuda, Yuji: *See*—
Hagiwara, Takaaki; Horiuchi, Masatada; Kondo, Ryuji; Yatsuda, Yuji; and Minami, Shinichi, 4,514,830, Cl. 365-200.000.
Yoh, Kanji: *See*—
Ando, Yoshibumi; Sakamoto, Takashi; Yoh, Kanji; Moriuchi, Hisahiro; and Takei, Sumiaki, 4,514,646, Cl. 307-200.00B.
Yokomori, Shinji; and Nakajima, Yoshihisa, to Fuji Electric Company, Ltd. Coin sorter with time-sharing circuit. 4,513,762, Cl. 133-3.00R.
Yonker, John H., to Otis Engineering Corporation. Valve. 4,513,764, Cl. 137-68.00R.
York, Theodore H., to Westinghouse Electric Corp. Coherent phase shift keyed demodulator with improved sampling apparatus and method. 4,514,697, Cl. 329-104.000.
Yoshida Kogyo K. K.: *See*—
Fukuroi, Takeo, 4,513,482, Cl. 24-384.000.
Kasai, Kazumi, 4,513,483, Cl. 24-409.000.
Yoshida, Toshiro: *See*—
Kikuchi, Junzo; Sugiura, Ryuzo; Yamamoto, Mutsuhiro; and Yoshida, Toshiro, 4,514,597, Cl. 179-99.00M.
Yoshida, Yasuhisa; and Ohi, Toshio, to Nippon GT Corporation. Manual reset type bimetal thermostat. 4,513,570, Cl. 60-529.000.
Yoshida, Yuji: *See*—
Hokamura, Sadakazu; Yamada, Seiji; Aritomi, Mitsutoshi; and Yoshida, Yuji, 4,514,445, Cl. 427-410.000.
Yoshii, Toshiya: *See*—
Tanaka, Kazuhiro; Kawakami, Ken-ichi; and Yoshii, Toshiya, 4,514,452, Cl. 428-141.000.
Yoshii, Yuji: *See*—
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, 4,514,150, Cl. 417-440.000.
Yoshikawa, Yukio: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,514,064, Cl. 354-234.100.
Yoshinaga, Toru: *See*—
Igashira, Toshihiko; and Yoshinaga, Toru, 4,514,657, Cl. 313-130.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Ichizawa, Yoshiyuki; Nomoto, Tsugio; and Oshida, Mamoru, 4,514,166, Cl. 425-436.00R.
Taguchi, Toshio; Akino, Hisashi; and Nozawa, Takamitsu, 4,513,877, Cl. 220-335.000.
Yoshioka, Hiroshi: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; Yoshioka, Hiroshi; and Nunose, Akira, 4,514,512, Cl. 502-107.000.
Yoshitomi Pharmaceutical Industries Ltd.: *See*—
Tashiro, Chiaki; Kawakita, Takeshi; Horii, Ichiro; and Anami, Koretake, 4,514,403, Cl. 514-274.000.
Yoshizawa, Hiroshi: *See*—
Nishikawa, Masao; Hattori, Torao; Aoki, Takashi; and Yoshizawa, Hiroshi, 4,513,638, Cl. 74-866.000.
Yoshizumi, Hajime; Matsumoto, Nobuya; Fukuda, Osamu; and Fukushi, Osamu, to Suntory Limited. Process for producing alcohol by fermentation without cooking. 4,514,496, Cl. 435-162.000.
Young, Harvey R., to United States of America, Army. Power management process. 4,514,142, Cl. 416-1.000.
Young, William C., to RCA Corporation. Device for indicating the polar coordinate position of a given point anywhere within a circular area. 4,513,505, Cl. 33-1.0MP.
Young, William R.: *See*—
Cohen, Paul; and Young, William R., 4,514,802, Cl. 364-200.000.
Yum, Daniel, to Burroughs Corporation. Low power small area PLA. 4,514,650, Cl. 307-466.000.
Zahnraderfabrik Renk AG: *See*—
John, Erich; and Pollak-Banda, Erich, 4,514,099, Cl. 384-100.000.
Zahnraderfabrik Renk A.G.: *See*—
Hirt, Manfred, 4,513,637, Cl. 74-801.000.
Zaltsman, Efim, to Monarch Wine Co., Inc. Bottle with a one-piece corking means. 4,513,870, Cl. 215-31.000.
Zanobini, Alessandro, to Nuovo Pignone S.p.A. Air-cooled steam condenser. 4,513,813, Cl. 165-111.000.
Zaruba, John V.; Hanson, Steven P.; Luecke, Beth E.; and Kuna, Wayne A., to Marvin Glass & Associates. Children's stuffed-art craft set. 4,514,175, Cl. 434-82.000.
Zauhar, Helmut: *See*—
Lossl, Gunter; Zauhar, Helmut; and Stock, Horst, 4,513,544, Cl. 51-283.00R.
Zenith Electronics Corporation: *See*—
Borg, Arthur N.; and Mark, William J., 4,514,764, Cl. 358-181.000.
Merrell, Richard G.; and Auld, Fredreck H., 4,514,761, Cl. 358-122.000.
Zimmer, Erich: *See*—
Ringel, Helmut; Zimmer, Erich; and Abdelmonem, Nabil, 4,514,296, Cl. 210-96.100.
Zimmer, Robert E.: *See*—
Doyle, Ralph R.; and Zimmer, Robert E., 4,513,894, Cl. 222-644.000.
Zimmerman, William T., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,514,213, Cl. 71-93.000.
Zimmermann, Volker: *See*—
Sakmann, Walter H.; and Zimmermann, Volker, 4,514,667, Cl. 318-254.000.
Zirkle, Charles L.: *See*—
Bondinell, William E.; Lafferty, John J.; and Zirkle, Charles L., 4,514,414, Cl. 514-422.000.
Zogg, Urs, to U.S. Philips Corporation. Logarithmic electronic gain control circuit. 4,514,702, Cl. 330-254.000.
Zola, John, to North American Philips Corporation. Method for fabricating composite transducers. 4,514,247, Cl. 156-250.000.
Zoleski, Benjamin H.: *See*—
Lu-Dai Sung, Rodney; Sweeney, William M.; and Zoleski, Benjamin H., 4,514,311, Cl. 252-32.500.
ZVL Vyzkumny ustav pro valiva loziska Brno koncernova ucelova organizace: *See*—
Rajsigl, Zdenek; Mladek, Milos; Blasko, Michal; and Smatana, Josef, 4,513,566, Cl. 57-406.000.
128980 Canada Inc.: *See*—
Garside, David, 4,513,582, Cl. 62-222.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beasley, John K.; and Urban, Edward J., to Du Pont de Nemours, E. I., and Company. Tree-resistant ethylene polymer compositions. Re. 31,874, Cl. 524-298.000.

Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., to Pitney Bowes Inc. Computer responsive postage meter. Re. 31,875, Cl. 364-900.000.

Du Pont de Nemours, E. I., and Company: *See*—
Beasley, John K.; and Urban, Edward J., Re. 31,874, Cl. 524-298.000.

Eckert, Alton B., Jr.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Hinman, Bruce E.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Howes, Randolph M. Venous catheter device. Re. 31,873, Cl. 128-674.000.

Jones, Howell A., Jr.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Lupkas, Raymond R.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, Re. 31,876, Cl. 315-366.000.

McFiggans, Robert B.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Nonomura, Kinzo: *See*—
Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, Re. 31,876, Cl. 315-366.000.

Pitney Bowes Inc.: *See*—
Check, Frank T., Jr.; Eckert, Alton B., Jr.; Hinman, Bruce E.; Jones, Howell A., Jr.; Lupkas, Raymond R.; and McFiggans, Robert B., Re. 31,875, Cl. 364-900.000.

Takesako, Yoshinobu: *See*—
Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, Re. 31,876, Cl. 315-366.000.

Urban, Edward J.: *See*—
Beasley, John K.; and Urban, Edward J., Re. 31,874, Cl. 524-298.000.

Watanabe, Masanori; Nonomura, Kinzo; and Takesako, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Picture display device. Re. 31,876, Cl. 315-366.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Creyf, Hubert S., to PRB N.V. Method of preparing polyurea foam materials. B1 4,334,944, 4-30-85, Cl. 156-308.200.

Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, to HSA Reactors Limited. Planar carbon fiber electrode structure. B1 4,326,938, 4-30-85, Cl. 204-228.000.

HSA Reactors Limited: *See*—
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, B1 4,326,938, Cl. 204-228.000.

Jacobs, James K.: *See*—
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, B1 4,326,938, Cl. 204-228.000.

McNeight, David L.; and Morris, William J., to Rieter-Scragg Ltd. Yarn processing. B1 4,033,105, 4-30-85, Cl. 57-339.000.

Mohanta, Samaresh: *See*—
Das Gupta, Sankar; Jacobs, James K.; and Mohanta, Samaresh, B1 4,326,938, Cl. 204-228.000.

Morris, William J.: *See*—
McNeight, David L.; and Morris, William J., B1 4,033,105, Cl. 57-339.000.

PRB N.V.: *See*—
Creyf, Hubert S., B1 4,334,944, Cl. 156-308.200.

Rieter-Scragg Ltd.: *See*—
McNeight, David L.; and Morris, William J., B1 4,033,105, Cl. 57-339.000.

LIST OF DESIGN PATENTEES

American Commercial Incorporated: *See*—
Seibel, Ben, 278,590, Cl. D7-13.000.
Seibel, Ben, 278,591, Cl. D7-13.000.
Seibel, Ben, 278,592, Cl. D7-13.000.

American Cyanamid Company: *See*—
Morgan, John H.; and Grip, John A., 278,603, Cl. D9-453.000.

Anderson, Jim. Double tipped drumstick. 278,634, 4-30-85, Cl. D17-22.000.

Anderson, Lyle R., to Minnesota Mining and Manufacturing Company. Telephone wire aerial enclosure. 278,623, 4-30-85, Cl. D13-24.000.

AT&T Technologies, Inc.: *See*—
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, 278,630, Cl. D14-115.000.

Baiman, Sybil: *See*—
Sussman, Barbara S.; and Baiman, Sybil, 278,611, Cl. D11-67.000.

Balbinot, Renzo: *See*—
Sartor, Mariano; and Balbinot, Renzo, 278,570, Cl. D2-276.000.

Bassani, Antoine. Key-holder. 278,575, 4-30-85, Cl. D3-61.000.

Bridgestone Tire Co., Ltd.: *See*—
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,617, Cl. D12-147.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,618, Cl. D12-147.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,568, 4-30-85, Cl. D2-40.000.

Briggery Myles, Jacquelyn A. Swimwear. 278,569, 4-30-85, Cl. D2-40.000.

Bromley, R. Scott, to Cartier Inc. Table. 278,584, 4-30-85, Cl. D6-484.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,635, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,636, Cl. D18-1.000.

Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,637, Cl. D18-1.000.
Bruel & Kjaer A/S: *See*—
Mathiasen, Hilmer, 278,625, Cl. D14-12.000.
Calnetics Corporation: *See*—
Hornak, Michael A., 278,651, Cl. D23-40.000.
Cantonis, Carl G. Note pad holder. 278,639, 4-30-85, Cl. D19-28.000.
Cartier Inc.: *See*—
Bromley, R. Scott, 278,584, Cl. D6-484.000.
Ceraulo, Salvatore M. Packaging container. 278,596, 4-30-85, Cl. D9-341.000.
Chachowski, Rosemary K.: *See*—
Savitz, Steven R.; Hawk, Johnna B.; Graham, Henry A., Jr.; and Chachowski, Rosemary K., 278,653, Cl. D24-22.000.
Collins, Robert T. Reversible seat for a bathtub or the like. 278,580, 4-30-85, Cl. D6-349.000.
Collison, Robert M.; and Myers, John V. Bicycle stand. 278,616, 4-30-85, Cl. D12-115.000.
Colquitt, Simone, to Syracuse China Corporation. Cup or similar article. 278,589, 4-30-85, Cl. D7-9.000.
Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, 278,644, Cl. D21-142.000.
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 278,657, Cl. D24-64.000.
Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 278,600, Cl. D9-399.000.
DeBarbrie, Steven J. Drum set. 278,633, 4-30-85, Cl. D17-22.000.
Decra-Stone, Inc.: *See*—
Knutson, Lawrence M., 278,588, Cl. D7-29.000.
Didisheim, Carol, to Omega Louis Brandt & Frere S.A. Watch case. 278,605, 4-30-85, Cl. D10-30.000.
Drackett Company, The: *See*—
Lane, James, 278,599, Cl. D9-377.000.
Eber, Gabriel. Masseur sandal. 278,571, 4-30-85, Cl. D2-293.000.
Einsel, Kenneth D. Planter. 278,613, 4-30-85, Cl. D11-152.000.
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, to AT&T Technologies, Inc. Console faceplate for teleconferencing bridge. 278,630, 4-30-85, Cl. D14-115.000.
Erlewine, Mark. Guitar. 278,632, 4-30-85, Cl. D17-14.000.
Everett, Richard C., to Kool-Stop International, Inc. Bicycle brake shoe. 278,620, 4-30-85, Cl. D12-180.000.
Flakt Aktiebolag: *See*—
Widerby, Lennart, 278,595, Cl. D8-389.000.
Formelprodukter: *See*—
Nordgren, Peter; and Sjoholm, Hans, 278,649, Cl. D21-230.000.
Fortuna, Vincent E., to Cosden Technology, Inc. Packaging container. 278,600, 4-30-85, Cl. D9-399.000.
Fratelli Saporiti Industria Arredamenti di Saporiti Sergio E Giorgio S.N.C.: *See*—
Milles, Victor A., 278,579, Cl. D6-334.000.
Fujii, Takashi: *See*—
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, 278,627, Cl. D14-77.000.
Fujitsu Limited: *See*—
Takagi, Hisamitsu; Hashiguchi, Hiroichi; and Takehara, Tomoyuki, 278,626, Cl. D14-53.000.
Fukasawa, Naoto; Suzuki, Susumu; and Uchihori, Noritaka, to Kabushiki Kaisha Suwa Seikosha. Portable television receiver. 278,628, 4-30-85, Cl. D14-77.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,635, 4-30-85, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,636, 4-30-85, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,637, 4-30-85, Cl. D18-1.000.
Gargioni, Emilio. Tote bag. 278,572, 4-30-85, Cl. D3-44.000.
Goettker, Bernhardt P.: *See*—
Law, Denny B.; and Goettker, Bernhardt P., 278,615, Cl. D12-101.000.
Graham, Henry A., Jr.: *See*—
Savitz, Steven R.; Hawk, Johnna B.; Graham, Henry A., Jr.; and Chachowski, Rosemary K., 278,653, Cl. D24-22.000.
Gramwell, Graham R., to Steward Smith Investments Limited. Finger ring. 278,610, 4-30-85, Cl. D11-30.000.
Green, David T.; Rawson, Paul O.; and Yagami, Richard H., to United States Surgical Corporation. Surgical skin stapler. 278,656, 4-30-85, Cl. D24-26.000.
Grip, John A.: *See*—
Morgan, John H.; and Grip, John A., 278,603, Cl. D9-453.000.
Gushiken, Shigeki: *See*—
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, 278,627, Cl. D14-77.000.
Gustafson, Linda G. Garment sleeve. 278,566, 4-30-85, Cl. D2-25.000.
Gwathmey, Charles; and Siegel, Robert, to Knoll International, Inc. Table. 278,577, 4-30-85, Cl. D6-484.000.
Harper, Alton A.: *See*—
Kramer, Joel A.; and Harper, Alton A., 278,582, Cl. D6-373.000.
Hashiguchi, Hiroichi: *See*—
Takagi, Hisamitsu; Hashiguchi, Hiroichi; and Takehara, Tomoyuki, 278,626, Cl. D14-53.000.
Hawk, Johnna B.: *See*—
Savitz, Steven R.; Hawk, Johnna B.; Graham, Henry A., Jr.; and Chachowski, Rosemary K., 278,653, Cl. D24-22.000.
Henkels, Walter. Combined holder for a writing instrument and covered receptacle. 278,641, 4-30-85, Cl. D19-77.000.
Hitachi, Ltd.: *See*—
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, 278,627, Cl. D14-77.000.
Hjelm, Sven Tore K. Emblem for jewelry or the like. 278,612, 4-30-85, Cl. D11-107.000.
Hopkins Engineering Company: *See*—
Stone, Davis P., 278,624, Cl. D13-24.000.
Horn, Douglas M.: *See*—
Slovak, Jack P.; Slovak, Robert A.; and Horn, Douglas M., 278,650, Cl. D23-3.000.
Hornak, Michael A., to Calnetics Corporation. Valve adaptor for LPG fuel tank. 278,651, 4-30-85, Cl. D23-40.000.
Hoshina, Noriyuki, to Toyo Radiator Co., Ltd. Oil cooler. 278,619, 4-30-85, Cl. D12-166.000.
Howard Enterprises, Inc.: *See*—
Moss, Howard E., 278,614, Cl. D11-152.000.
Hunnell, Gary B. Auxiliary engine mount for a boat transom. 278,622, 4-30-85, Cl. D12-317.000.
Iacullo, Robert F.: *See*—
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, 278,630, Cl. D14-115.000.
Interlego A.G.: *See*—
Nielsen, Jacob, 278,645, Cl. D21-161.000.
Ishii, Kenshun: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 278,657, Cl. D24-64.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, 278,644, Cl. D21-142.000.
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 278,657, Cl. D24-64.000.
Itoh, Masafumi: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,635, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,636, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,637, Cl. D18-1.000.
IVAC Corporation: *See*—
Scappaticci, Brian A., 278,655, Cl. D24-52.000.
Jensen, Robert L. Book holder. 278,578, 4-30-85, Cl. D6-419.000.
Jewish Federation of Allentown: *See*—
Sussman, Barbara S.; and Baiman, Sybil, 278,611, Cl. D11-67.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fukasawa, Naoto; Suzuki, Susumu; and Uchihori, Noritaka, 278,628, Cl. D14-77.000.
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, to Hitachi, Ltd. Television monitor. 278,627, 4-30-85, Cl. D14-77.000.
Kawabata, Misao: *See*—
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,617, Cl. D12-147.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,618, Cl. D12-147.000.
Kilpatrick, George N. Spare key holder or similar article. 278,574, 4-30-85, Cl. D3-61.000.
Kiyota, Tohru: *See*—
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, 278,627, Cl. D14-77.000.
Knoll International, Inc.: *See*—
Gwathmey, Charles; and Siegel, Robert, 278,577, Cl. D6-484.000.
Knutson, Lawrence M., to Decra-Stone, Inc. Bowl. 278,588, 4-30-85, Cl. D7-29.000.
Koguma, Seiji, to Okamura Corporation. Desk. 278,583, 4-30-85, Cl. D6-426.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, to Bridgestone Tire Co., Ltd. Vehicle tire. 278,617, 4-30-85, Cl. D12-147.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, to Bridgestone Tire Co., Ltd. Vehicle tire. 278,618, 4-30-85, Cl. D12-147.000.
Kool-Stop International, Inc.: *See*—
Everett, Richard C., 278,620, Cl. D12-180.000.
Koper, Barry R. Facial appliance for makeup. 278,647, 4-30-85, Cl. D21-190.000.
Koper, Barry R. Facial appliance for makeup. 278,648, 4-30-85, Cl. D21-190.000.
Kraemer, Herbert. Pneumatic conveyor terminal. 278,638, 4-30-85, Cl. D18-35.000.
Kramer, Joel A.; and Harper, Alton A., to Tropitone Furniture Co., Inc. Lounge chair. 278,582, 4-30-85, Cl. D6-373.000.
Kriete, Richard J.: *See*—
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, 278,630, Cl. D14-115.000.
Kuroiwa, Yukio: *See*—
Kashima, Taisuke; Gushiken, Shigeki; Kuroiwa, Yukio; Kiyota, Tohru; and Fujii, Takashi, 278,627, Cl. D14-77.000.
Lane, James, to Drackett Company, The. Bottle. 278,599, 4-30-85, Cl. D9-377.000.

Law, Denny B.; and Goettker, Bernhardt P., to Unique Functional Products. Trailer for a three-wheel cycle or the like. 278,615, 4-30-85, Cl. D12-101.000.

Leaf, Charles R.: *See*—
Rivkin, Bernard W.; and Leaf, Charles R., 278,576, Cl. D6-317.000.

Lindsey, Donald A. Heat saving device. 278,652, 4-30-85, Cl. D23-136.000.

Lodrick, Lawrence E., Sr. Light fixture. 278,659, 4-30-85, Cl. D26-85.000.

Lye, Howard D. Ratchet wrench socket unit nut ejector spring retainer. 278,594, 4-30-85, Cl. D8-25.000.

MacGregor, Francis W., to Stanley Works, The. Ratchet handle for hand tool. 278,593, 4-30-85, Cl. D8-83.000.

Mair, Franz: *See*—
Tichy, Heinz; and Mair, Franz, 278,607, Cl. D10-111.000.

Major, Clare M.: *See*—
Major, Frederick A., deceased, 278,631, Cl. D15-7.000.

Major, Clare M., personal representative: *See*—
Major, Frederick A., deceased, 278,631, Cl. D15-7.000.

Major, Frederick A., deceased (by Major, Clare M., personal representative), to Major, Clare M. Evaporative cooler pump. 278,631, 4-30-85, Cl. D15-7.000.

Mannato, Piero, to Plastimoda Italiana S.r.l. Panelled baggage unit. 278,573, 4-30-85, Cl. D3-48.000.

Manville Service Corporation: *See*—
Wilson, Jerry F., 278,601, Cl. D9-433.000.

Martinez, Ernest. Football clapper. 278,642, 4-30-85, Cl. D21-64.000.

Mathiasen, Hilmer, to Bruel & Kjaer A/S. Microphone. 278,625, 4-30-85, Cl. D14-12.000.

Matsumoto, Susumu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, 278,644, Cl. D21-142.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Mitani, Kiyoshi; Yonekura, Hiroshi; Suzuki, Kiyoshi; and Sugihara, Osamu, 278,629, Cl. D14-80.000.

McAlinden, Daniel, to Sunbeam Plastics Corporation. Bottle. 278,597, 4-30-85, Cl. D9-349.000.

McCoy, Kenneth H. Stuffed novelty mouse figure or the like. 278,646, 4-30-85, Cl. D21-188.000.

Melchior, Merle C. Chair. 278,581, 4-30-85, Cl. D6-373.000.

Milles, Victor A., to Fratelli Saporiti Industria Arredamenti di Saporiti Sergio E Giorgio S.N.C. Seat. 278,579, 4-30-85, Cl. D6-334.000.

Minnesota Mining and Manufacturing Company: *See*—
Anderson, Lyle R., 278,623, Cl. D13-24.000.

Mitani, Kiyoshi; Yonekura, Hiroshi; Suzuki, Kiyoshi; and Sugihara, Osamu, to Matsushita Electric Industrial Co., Ltd. Television receiver. 278,629, 4-30-85, Cl. D14-80.000.

Morgan, John H.; and Grip, John A., to American Cyanamid Company. Container cap. 278,603, 4-30-85, Cl. D9-453.000.

Morishita, Masayuki: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,635, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,636, Cl. D18-1.000.
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,637, Cl. D18-1.000.

Moriya, Masashiro: *See*—
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,617, Cl. D12-147.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,618, Cl. D12-147.000.

Moss, Howard E., to Howard Enterprises, Inc. Container for multiple plant growth. 278,614, 4-30-85, Cl. D11-152.000.

Multer, Gary. Pad of paper. 278,640, 4-30-85, Cl. D19-28.000.

Myers, John V.: *See*—
Collison, Robert M.; and Myers, John V., 278,616, Cl. D12-115.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, to Combi Co., Ltd. Driving toy. 278,644, 4-30-85, Cl. D21-142.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, to Combi Co., Ltd. Medical corset. 278,657, 4-30-85, Cl. D24-64.000.

National Child Safety Council: *See*—
Satterelli, Joanne, 278,609, Cl. D11-2.000.

Nielsen, Jacob, to Interlego A.G. Toy poodle figure. 278,645, 4-30-85, Cl. D21-161.000.

Nordgren, Peter; and Sjoholm, Hans, to Formelprodukter. Ski pole grip. 278,649, 4-30-85, Cl. D21-230.000.

Nordica S.p.A: *See*—
Sartor, Mariano; and Balbinot, Renzo, 278,570, Cl. D2-276.000.

Ogawa, Iwakichi, to Takara Co., Ltd. Reconfigurable toy. 278,643, 4-30-85, Cl. D21-128.000.

Okamura Corporation: *See*—
Koguma, Seiji, 278,583, Cl. D6-426.000.

Oldham, Rodnie D. Rotatable storage rack for spice jars and the like. 278,585, 4-30-85, Cl. D6-513.000.

Omega Louis Brandt & Frere S.A.: *See*—
Didisheim, Carol, 278,605, Cl. D10-30.000.

Ortho Diagnostic Systems Inc.: *See*—
Savitz, Steven R.; Hawk, Johnna B.; Graham, Henry A., Jr.; and Chachowski, Rosemary K., 278,653, Cl. D24-22.000.

P.P.M.D.: *See*—
Rivkin, Bernard W.; and Leaf, Charles R., 278,576, Cl. D6-317.000.

Plastimoda Italiana S.r.l.: *See*—
Mannato, Piero, 278,573, Cl. D3-48.000.

Rasmussen, Ronald. Martial arts leg and foot protector. 278,567, 4-30-85, Cl. D2-27.000.

Rawson, Paul O.: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard H., 278,656, Cl. D24-26.000.

Rivkin, Bernard W.; and Leaf, Charles R., to P.P.M.D. Hanger. 278,576, 4-30-85, Cl. D6-317.000.

Rosenstein, Florence. Plastic threaded cover for a container. 278,602, 4-30-85, Cl. D9-449.000.

Sartor, Mariano; and Balbinot, Renzo, to Nordica S.p.A. Ski boot. 278,570, 4-30-85, Cl. D2-276.000.

Satterelli, Joanne, to National Child Safety Council. Pendant medical microfilm reader. 278,609, 4-30-85, Cl. D11-2.000.

Savitz, Steven R.; Hawk, Johnna B.; Graham, Henry A., Jr.; and Chachowski, Rosemary K., to Ortho Diagnostic Systems Inc. Centrifuge tube for separating and washing red blood cells. 278,653, 4-30-85, Cl. D24-22.000.

Scanlan International, Inc.: *See*—
Scanlan, Timothy M., 278,654, Cl. D24-27.000.

Scanlan, Timothy M., to Scanlan International, Inc. Anastomosis frame. 278,654, 4-30-85, Cl. D24-27.000.

Scappaticci, Brian A., to IVAC Corporation. Combined bottom cap and drop former with a sensor-mounting flange for an I.V. burette chamber. 278,655, 4-30-85, Cl. D24-52.000.

Scher, Wesley. Automobile fender skirt ornament. 278,621, 4-30-85, Cl. D12-190.000.

Seibel, Ben, to American Commercial Incorporated. Champagne glass. 278,590, 4-30-85, Cl. D7-13.000.

Seibel, Ben, to American Commercial Incorporated. Champagne glass. 278,591, 4-30-85, Cl. D7-13.000.

Seibel, Ben, to American Commercial Incorporated. Wine glass. 278,592, 4-30-85, Cl. D7-13.000.

Semperit Aktiengesellschaft: *See*—
Tichy, Heinz; and Mair, Franz, 278,607, Cl. D10-111.000.

Siegel, Robert: *See*—
Gwathmey, Charles; and Siegel, Robert, 278,577, Cl. D6-484.000.

Sjoholm, Hans: *See*—
Nordgren, Peter; and Sjoholm, Hans, 278,649, Cl. D21-230.000.

Slovak, Jack P.; Slovak, Robert A.; and Horn, Douglas M. Water purifier. 278,650, 4-30-85, Cl. D23-3.000.

Slovak, Robert A.: *See*—
Slovak, Jack P.; Slovak, Robert A.; and Horn, Douglas M., 278,650, Cl. D23-3.000.

Stanley Works, The: *See*—
MacGregor, Francis W., 278,593, Cl. D8-83.000.

Steward Smith Investments Limited: *See*—
Gramwell, Graham R., 278,610, Cl. D11-30.000.

Stone, Davis P., to Hopkins Engineering Company. Electrical power module. 278,624, 4-30-85, Cl. D13-24.000.

Sugihara, Osamu: *See*—
Mitani, Kiyoshi; Yonekura, Hiroshi; Suzuki, Kiyoshi; and Sugihara, Osamu, 278,629, Cl. D14-80.000.

Sunbeam Plastics Corporation: *See*—
McAlinden, Daniel, 278,597, Cl. D9-349.000.

Sussman, Barbara S.; and Baiman, Sybil, to Jewish Federation of Allentown. Apple-shaped broach. 278,611, 4-30-85, Cl. D11-67.000.

Suzuki, Kiyoshi: *See*—
Mitani, Kiyoshi; Yonekura, Hiroshi; Suzuki, Kiyoshi; and Sugihara, Osamu, 278,629, Cl. D14-80.000.

Suzuki, Shigeo. Grain moisture meter. 278,606, 4-30-85, Cl. D10-56.000.

Suzuki, Susumu: *See*—
Fukasawa, Naoto; Suzuki, Susumu; and Uchihori, Noritaka, 278,628, Cl. D14-77.000.

Syracuse China Corporation: *See*—
Colquitt, Simone, 278,589, Cl. D7-9.000.

Takagi, Hisamitsu; Hashiguchi, Hiroichi; and Takehara, Tomoyuki, to Fujitsu Limited. Mobile telephone set. 278,626, 4-30-85, Cl. D14-53.000.

Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 278,643, Cl. D21-128.000.

Takehara, Tomoyuki: *See*—
Takagi, Hisamitsu; Hashiguchi, Hiroichi; and Takehara, Tomoyuki, 278,626, Cl. D14-53.000.

Tanaka Manufacturing Co., Ltd.: *See*—
Tanaka, Yoshihisa, 278,658, Cl. D26-60.000.

Tanaka, Yoshihisa, to Tanaka Manufacturing Co., Ltd. Clip light for vehicles. 278,658, 4-30-85, Cl. D26-60.000.

Thompson, Bruce R. Combined toothbrush and tumbler holder. 278,586, 4-30-85, Cl. D6-531.000.

Thompson, Bruce R. Soap holder. 278,587, 4-30-85, Cl. D6-540.000.

Thompson, Sara R. Toed shoe. 278,608, 4-30-85, Cl. D2-279.000.

Tichy, Heinz; and Mair, Franz, to Semperit Aktiengesellschaft. Road reflector or similar article. 278,607, 4-30-85, Cl. D10-111.000.

Tilley, Alvin R.: *See*—
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, 278,630, Cl. D14-115.000.

Toyo Radiator Co., Ltd.: *See*—
Hoshina, Noriyuki, 278,619, Cl. D12-166.000.

Tropitone Furniture Co., Inc.: *See*—
Kramer, Joel A.; and Harper, Alton A., 278,582, Cl. D6-373.000.

Uchihori, Noritaka: *See*—
Fukasawa, Naoto; Suzuki, Susumu; and Uchihori, Noritaka, 278,628, Cl. D14-77.000.

Unique Functional Products: *See*—
Law, Denny B.; and Goettker, Bernhardt P., 278,615, Cl. D12-101.000.

United States Surgical Corporation: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard H., 278,656, Cl. D24-26.000.
Van Zandt, John M. Display holder for a container of lipstick or the like. 278,604, 4-30-85, Cl. D9-457.000.
Watanabe, Chokichi. Seaweed plate garnish for a sushi dish or the like. 278,565, 4-30-85, Cl. D1-123.000.
Weber, Heinz. Combined bottle and cap. 278,598, 4-30-85, Cl. D9-353.000.
Weinglass, Leon: *See*—
Ender, Alfred R.; Iacullo, Robert F.; Kriete, Richard J.; Tilley, Alvin R.; and Weinglass, Leon, 278,630, Cl. D14-115.000.
Widerby, Lennart, to Flakt Aktiebolag. Fastener for exhaust air valves. 278,595, 4-30-85, Cl. D8-389.000.
Wilson, Jerry F., to Manville Service Corporation. Article carrier blank. 278,601, 4-30-85, Cl. D9-433.000.
Yagami, Richard H.: *See*—
Green, David T.; Rawson, Paul O.; and Yagami, Richard H., 278,656, Cl. D24-26.000.
Yamaoka, Masataka: *See*—
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,617, Cl. D12-147.000.
Kojima, Hiroshi; Kawabata, Misao; Yamaoka, Masataka; and Moriya, Masashiro, 278,618, Cl. D12-147.000.
Yonekura, Hiroshi: *See*—
Mitani, Kiyoshi; Yonekura, Hiroshi; Suzuki, Kiyoshi; and Sugihara, Osamu, 278,629, Cl. D14-80.000.

LIST OF PLANT PATENTEES

Blazey, Daniel, to Nor'East Miniature Roses, Inc. Rose plant—Blabee. 5,448, 4-30-85, Cl. 7.000.
Bradford, Norman G. Nectarine tree (May Diamond). 5,454, 4-30-85, Cl. 41.000.
Bradford, Norman G. Nectarine tree (Spring Diamond). 5,455, 4-30-85, Cl. 41.000.
Bradford, Norman G. Nectarine tree (Sun Diamond). 5,456, 4-30-85, Cl. 41.000.
Garabedian, John M. Plum tree, "Early Gar Rosa". 5,453, 4-30-85, Cl. 38.000.
Holden, Verl L. Blue spruce tree "Baby Blueyes" variety. 5,457, 4-30-85, Cl. 50.000.
Nor'East Miniature Roses, Inc.: *See*—
Blazey, Daniel, 5,448, Cl. 7.000.
Saville, F. Harmon, 5,449, Cl. 10.000.
Saville, F. Harmon, 5,450, Cl. 10.000.
Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant—Savanhour. 5,449, 4-30-85, Cl. 10.000.
Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Rose plant—Savaspir. 5,450, 4-30-85, Cl. 10.000.
Weeks, O. L. Rose plant. 5,451, 4-30-85, Cl. 14.000.
Weeks, O. L. Rose plant. 5,452, 4-30-85, Cl. 18.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 30, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	4,513,449
19	4,513,450
69	4,513,451
81	4,513,452
150	4,513,453
246	4,513,454
253	4,513,455

CLASS 3

13	4,513,456
15	4,513,457

CLASS 4

192	4,513,458
222	4,513,459

CLASS 5

13	4,513,460
413	4,513,461
442	4,513,462
452	4,513,463

CLASS 8

94.21	4,514,184
137	4,514,185
159	4,513,464
527	4,514,186
531	4,514,187
641	4,514,188

CLASS 14

17	4,513,465

CLASS 15

29	4,513,466
53 AB	4,513,467
250.36	4,513,468
319	4,513,469
328	4,513,470
340	4,513,471
354	4,513,472

CLASS 16

82	4,513,473
243	4,513,474
360	4,513,475

CLASS 17

44.1	4,513,476
46	4,513,477
71	4,513,478

CLASS 19

80 R	4,513,479
113	4,513,480
244	4,513,481

CLASS 24

384	4,513,482
409	4,513,483
437	4,513,484

CLASS 28

181	4,513,485

CLASS 29

220	4,513,486
243.5	4,513,487
516	4,513,488
520	4,513,489
527.6	4,513,490
527.7	4,513,491
564.7	4,513,492
566.3	4,513,493
576 B	4,513,494
597	4,513,495
606	4,513,496
727	4,513,497
845	4,513,498
874	4,513,499
885	4,513,500

CLASS 30

115	4,513,501
229	4,513,502
289	4,513,503

CLASS 33

1 H	4,513,504
1 MP	4,513,505
147 K	4,513,506
169 R	4,513,507
288	4,513,508
330	4,513,509
419	4,513,510
447	4,513,511
471	4,513,512

CLASS 34

1	4,513,513
24	4,513,514
33	4,513,515
41	4,513,516
114	4,513,517

CLASS 36

44	4,513,518
113	4,513,519
119	4,513,520

CLASS 37

193	4,513,521

CLASS 40

2 R	4,513,522

CLASS 42

72	4,513,523

CLASS 43

43.12	4,513,524
55	4,513,525
57.2	4,513,526
87	4,513,527

CLASS 44

51	4,514,189
70	4,514,190

CLASS 47

1.5	4,513,528
2	4,513,529
9	4,513,530
39	4,513,531
58	4,513,532
63	4,513,533

CLASS 48

77	4,514,191

CLASS 49

91	4,513,534
409	4,513,535
470	4,513,536

CLASS 51

71	4,513,537
131.3	4,513,538
138	4,513,539
165.71	4,513,540
237 R	4,513,541
241 S	4,513,542
283 R	4,513,543
	4,513,544
295	4,514,192

CLASS 52

79.1	4,513,545
172	4,513,546
194	4,513,547
202	4,513,548
211	4,513,549
249	4,513,550
364	4,513,551
400	4,513,552
456	4,513,553
657	4,513,554
	4,513,555
698	4,513,556
735	4,513,557

CLASS 53

77	4,513,558
429	4,513,559
509	4,513,560

CLASS 54

83 R	4,513,561

CLASS 55

91	4,514,194
152	4,514,195
223	4,514,196
290	4,514,193
316	4,514,197
337	4,514,198
	4,514,199
368	4,514,200
385 B	4,514,201
440	4,514,202

CLASS 56

10.2	4,513,562
295	4,513,563

CLASS 57

206	4,513,564
236	4,513,565
339	B1 4,033,105
406	4,513,566

CLASS 60

39.02	4,513,567
39.31	4,513,569
39.6	4,513,568
529	4,513,570
603	4,513,571
618	4,513,572
648	4,513,573

CLASS 62

17	4,514,203
41	4,514,204
59	4,513,574
86	4,513,575
87	4,513,576
91	4,513,577
149	4,513,578
176.2	4,513,579
183	4,513,580
197	4,513,581
222	4,513,582
235	4,513,583
235.1	4,513,584
238.6	4,513,585
263	4,513,586
515	4,513,587

CLASS 65

12	4,514,205
21.1	4,514,207
108	4,514,206
273	4,514,208
328	4,514,209

CLASS 66

126 R	4,513,588
180	4,513,589

CLASS 68

18 C	4,513,590

CLASS 70

34	4,513,591
	4,513,592
114	4,513,593

CLASS 71

92	4,514,210
	4,514,211
93	4,514,212
	4,514,213
	4,514,214
107	4,514,215

CLASS 72

8	4,513,594
43	4,513,595
51	4,513,596
53	4,513,597
62	4,513,598
238	4,513,599
345	4,513,600
398	4,513,601
405	4,513,602

CLASS 73

37	4,513,603
39	4,513,604
40	4,513,605
61 R	4,513,606
61.4	4,513,607
73	4,513,608
116	4,513,609
147	4,513,610
150 R	4,513,611
155	4,513,612
159	4,513,613
169	4,513,614
204	4,513,615
295	4,513,616
313	4,513,617
382 G	4,513,618
455	4,513,619
631	4,513,621
664	4,513,620
	4,513,622
721	4,513,623
861.12	4,513,624
861.72	4,513,625
862.34	4,513,626
	4,513,627
	4,513,628

CLASS 74

2	4,513,629
60	4,513,630
360	4,513,631
484 R	4,513,632
650	4,513,633
688	4,513,634
713	4,513,635
761	4,513,636
801	4,513,637
866	4,513,638
	4,513,639
870	4,513,640

CLASS 75

0.5 AA	4,514,216
10 R	4,514,217
12	4,514,218
43	4,514,219
60	4,514,220
63	4,514,221
77	4,514,222
	4,514,223
238	4,514,224

CLASS 81

53 R	4,513,642
53.2	4,513,643
57.39	4,513,644
	4,513,645
486	4,513,641

CLASS 82

1 C	4,513,646

CLASS 83

203	4,513,647
871	4,513,648
883	4,513,649

CLASS 84

1.03	4,513,650
1.22	4,513,651
20	4,513,652

CLASS 91

239	4,513,653
378	4,513,654

CLASS 98

121.2	4,513,655

CLASS 99

450.4	4,513,656
472	4,513,657
485	4,513,658

CLASS 100

117	4,513,659

CLASS 101

1	4,513,660
93.04	4,513,661
207	4,513,662
349	4,513,663

CLASS 102

216	4,513,664
312	4,513,665
476	4,513,666
487	4,513,667
511	4,513,668

CLASS 106

15.05	4,514,225
23	4,514,226
38.2	4,514,227
98	4,514,228
135	4,514,229
243	4,514,230
309	4,514,231

CLASS 108

111	4,513,669

CLASS 109

24.1	4,513,670

CLASS 110

101 CF	4,513,671

CLASS 112

100	4,513,672
166	4,513,673
220	4,513,674
236	4,513,675
262.1	4,513,676
262.3	4,513,677
323	4,513,678

CLASS 114

67 A	4,513,679
159	4,513,680
293	4,513,681

CLASS 118

322	4,513,682
620	4,513,683
718	4,513,684

CLASS 119

1	4,513,685
15.6	4,513,686
27	4,513,687
52 A	4,513,688
82	4,513,689
99	4,513,690
	4,513,691
109	4,513,692
147 R	4,513,693

CLASS 122

7 R	4,513,694

CLASS 123

41.02	4,513,696
41.1	4,513,695
41.35	4,513,697
52 MB	4,513,699
52 MV	4,513,698
179 L	4,513,700
188 AA	4,513,701
193 CH	4,513,703
193 H	4,513,702
196 S	4,513,704
	4,513,705
198 D	4,513,706
242	4,513,707
263	4,513,708
306	4,513,709
339	4,513,710
	4,513,711
	4,513,712
	4,513,713
357	4,513,714
383	4,513,715
425	4,513,716
	4,513,717
	4,513,718
447	4,513,719
470	4,513,720
478	4,513,721
492	4,513,722
	4,513,723
500	4,513,724
511	4,513,725
523	4,513,726
525	4,513,727
527	4,513,728
563	4,513,729
564	4,513,730

CLASS 126

432	4,513,731
433	4,513,732
435	4,513,733
439	4,513,734

CLASS 128

24.2	4,513,735
41	4,513,736
52	4,513,737
57	4,513,738
92 D	4,513,744
156	4,513,739
165	4,513,740
205.25	4,513,741
305	4,513,745
317	4,513,742
334 C	4,513,746
339	4,513,747
419 PG	4,513,743
653	4,513,748
660	4,513,749
	4,513,750
666	4,513,751
674	Re.31,873
696	4,513,752
706	4,513,753
753	4,513,754

CLASS 131

84 C	4,513,755
111	4,513,756
276	4,513,757
291	4,513,758
303	4,513,759

CLASS 132

11 R	4,513,842
40	4,513,760
41	4,513,761

CLASS 133

3 R	4,513,762

CLASS 134

1	4,514,232

CLASS 136

249	4,514,579
250	4,514,580
255	4,514,581
256	4,514,582
259	4,514,583
263	4,514,584

CLASS 137

38	4,513,763
68 R	4,513,764
72	4,513,765
103	4,513,766
119	4,513,767
142	4,513,768
315	4,513,769
	4,513,770
	4,513,771
355.22	4,513,772
382	4,513,773
392	4,513,774
491	4,513,775
498	4,513,776
501	4,513,777
533.11	4,513,778
556	4,513,779
625.41	4,513,781
625.63	4,513,782
625.65	4,513,780
625.68	4,513,783
854	4,513,784
881	4,513,785

CLASS 138

89	4,513,786
	4,513,788
106	4,514,103
166	4,513,787

CLASS 139

85	4,513,789
110	4,513,790
194	4,513,791
439	4,513,792

CLASS 140

92.4	4,513,793
105	4,513,794

CLASS 141

35	4,513,795
83	4,513,796
198	4,513,797

CLASS 144

28.11	4,513,798
379	4,513,799

CLASS 148

1.5	4,514,233
11.5 P	4,514,234

37 4,514,235
38 4,514,236
142 4,514,237
431 4,514,238

CLASS 149

18 4,514,239

CLASS 152

213 A 4,513,800
213 R 4,513,801
353 R 4,513,802
427 4,513,803

CLASS 156

73.5 4,514,242
79 4,514,241
89 4,514,240
113 4,514,243
158 4,514,244
161 4,514,245
250 4,514,247
264 4,514,246
268 4,514,248
308.2 B1 4,334,944
553 4,514,249
610 4,514,250
628 4,514,251
643 4,514,252
656 4,514,254
659.1 4,514,253

CLASS 160

174 4,513,804
299 4,513,805

CLASS 162

9 4,514,255
30.11 4,514,256
49 4,514,257
107 4,514,258
343 4,514,259

CLASS 164

413 4,513,806

CLASS 165

10 4,513,807
43 4,513,808
54 4,513,809
61 4,513,810
79 4,513,811
80 B 4,513,812
111 4,513,813
134 R 4,513,814

CLASS 166

57 4,513,815
75 R 4,513,816
138 4,513,817
244 C 4,513,818
263 4,513,819
266 4,513,820
273 4,513,821
382 4,513,822
386 4,513,823

CLASS 168

4 4,513,824
12 4,513,825

CLASS 172

7 4,513,826

CLASS 173

12 4,513,827
139 4,513,828

CLASS 174

35 GC 4,514,585
35 MS 4,514,586
52 H 4,514,587
52 PE 4,514,588
119 R 4,514,589
152 GM 4,514,590
182 4,514,591

CLASS 175

339 4,513,829

CLASS 177

1 4,513,830
189 4,513,831

CLASS 178

22.11 4,514,592

CLASS 179

2 A 4,514,593
2.51 4,514,594
16 F 4,514,595
84 T 4,514,596
99 M 4,514,597
146 R 4,514,598
181 W 4,514,599

CLASS 180

6.5 4,513,832
9.1 4,513,833
70.1 4,513,834
142 4,513,835
177 4,513,836
209 4,513,837
219 4,513,838
253 4,513,839

CLASS 181

210 4,513,840
252 4,513,841

CLASS 188

62 4,513,843
71.6 4,513,844
299 4,513,845
380 4,513,846

CLASS 192

3.58 4,513,850
4 A 4,513,847
18 R 4,513,848
70.27 4,513,849

CLASS 194

51 4,513,851

CLASS 198

399 4,513,852
410 4,513,853
472 4,513,854
473 4,513,855
695 4,513,856
716 4,513,857
812 4,513,858
842 4,513,859

CLASS 200

5 E 4,514,601
5 R 4,514,600
16 C 4,514,602
61.62 4,514,603
83 N 4,514,604
146 R 4,514,606
148 A 4,514,605
150 A 4,514,607
153 J 4,514,608
159 A 4,514,609

CLASS 202

270 4,514,260

CLASS 203

9 4,514,261
51 4,514,262

CLASS 204

1 T 4,514,263
15 4,514,264
4,514,265
28 4,514,266
44.2 4,514,267
67 4,514,268
69 4,514,269
151 4,514,270
159.15 4,514,271
186 4,514,272
196 4,514,273
228 B1 4,326,938
290 F 4,514,274
298 4,514,275
415 4,514,276
424 4,514,277
430 4,514,278

CLASS 206

150 4,513,860
219 4,513,861
233 4,513,862
264 4,513,863
396 4,513,864
508 4,513,865
570 4,513,866

CLASS 208

10 4,514,279
33 4,514,280
47 4,514,281
56 4,514,282
86 4,514,283
140 4,514,284
148 4,514,285
196 4,514,286
309 4,514,287

CLASS 209

5 4,514,288
44.2 4,513,867
127.3 4,514,289
166 4,514,290
4,514,291
167 4,514,292
4,514,293
581 4,513,868

CLASS 210

87 4,514,294
90 4,514,295
96.1 4,514,296
194 4,514,297
232 4,514,298
242.3 4,514,299
342 4,514,300
400 4,514,301
433.2 4,514,302
519 4,514,303
638 4,514,304
703 4,514,305
740 4,514,306
751 4,514,307

CLASS 212

175 4,513,869

CLASS 215

31 4,513,870
32 4,513,871

CLASS 219

69 M 4,514,611
119 4,514,612
121 EC 4,514,613
125.11 4,514,614
132 4,514,615
136 4,514,616
314 4,514,617
370 4,514,618
483 4,514,619
553 4,514,620

CLASS 220

74 4,513,872
89 A 4,513,873
4,513,874
214 4,513,875
270 4,513,876
335 4,513,877

CLASS 221

40 4,513,878
150 HC 4,513,879
260 4,513,880

CLASS 222

54 4,513,881
56 4,513,882
83 4,513,883
94 4,513,884
95 4,513,885
146.5 4,513,886
4,513,887
153 4,513,888
4,513,889
4,513,890
213 4,513,891
235 4,513,892
281 4,513,893
644 4,513,894

CLASS 224

151 4,513,895
178 4,513,896
314 4,513,897

CLASS 226

44 4,513,898
141 4,513,899

CLASS 227

42 4,513,900
49 4,513,901

CLASS 228

25 4,513,902
107 4,513,903
116 4,513,904
123 4,513,905
184 4,513,906

CLASS 229

23 R 4,513,907
87 C 4,513,908

CLASS 235

400 4,514,621
463 4,514,622
482 4,514,623

CLASS 236

26 R 4,513,909
4,513,910

CLASS 237

12.3 C 4,513,911

CLASS 238

349 4,513,912

CLASS 239

119 4,513,913
121 4,513,914
453 4,513,916
455 4,513,915

CLASS 241

46.11 4,513,917
101.4 4,513,918
275 4,513,919

CLASS 242

4 B 4,513,920
36 4,513,921
54 R 4,513,922
55.2 4,513,923
67.2 4,513,924
84.2 G 4,513,926
84.5 A 4,513,925
191 4,513,927
198 4,513,928
4,513,929
218 4,513,930

CLASS 244

152 4,513,931
153 R 4,513,932

CLASS 248

27.1 4,513,933
49 4,513,934
105 4,513,935
122 4,513,936
394 4,513,937
507 4,513,938
544 4,513,939
4,513,994
674 4,513,940

CLASS 249

91 4,513,941
95 4,513,942

CLASS 250

211 R 4,514,624
221 4,514,625
235 4,514,626
255 4,514,627
299 4,514,628
311 4,514,629
342 4,514,630
4,514,631
343 4,514,635
368 4,514,632
374 4,514,633
397 4,514,634
443.1 4,514,636
492.2 4,514,637
4,514,638
493.1 4,514,639
517.1 4,514,640
570 4,514,641

CLASS 251

31 4,513,943
89 4,513,944
129 4,513,945
173 4,513,946
174 4,513,947
212 4,513,948
266 4,513,949

CLASS 252

8.5 C 4,514,308
8.55 R 4,514,309
4,514,310
32.5 4,514,311
4,514,312
42.7 4,514,313
56 D 4,514,314
75 4,514,315
182 4,514,316
299.62 4,514,317
315.3 4,514,318
321 4,514,319
392 4,514,320
512 4,514,321
518 4,514,322
522 R 4,514,323
4,514,324
557 4,514,325
602 4,514,326
607 4,514,327
609 4,514,328
629 4,514,329

CLASS 254

8 B 4,513,950
28 4,513,951
285 4,513,952

CLASS 260

112.5 E 4,514,332
112.5 R 4,514,330
112.5 T 4,514,331
239 A 4,514,333
395 4,514,334
397.1 4,514,393
400 4,514,335
413 4,514,336
429.3 4,514,337
429.9 4,514,338
453 P 4,514,339
465 D 4,514,340
467 4,514,341
952 4,514,342

CLASS 261

37 4,514,343
159 4,514,344

CLASS 264

22 4,514,345
29.5 4,514,346
32 4,514,347
40.1 4,514,348
103 4,514,349
176 F 4,514,350
210.2 4,514,351
230 4,514,352
294 4,514,353
324 4,514,354
328.12 4,514,356
328.16 4,514,357
332 4,514,355

CLASS 267

121 4,513,953
141.3 4,513,954

CLASS 269

41 4,513,955

CLASS 271

9 4,513,956
90 4,513,957
187 4,513,958
270 4,513,959

CLASS 272

44 4,513,960
62 4,513,961
68 4,513,962
128 4,513,963

CLASS 273

26 R 4,513,965
68 B 4,513,966
108 4,513,967
126 R 4,513,964
143 R 4,513,968
149 R 4,513,969
153 R 4,513,971
153 S 4,513,970
190 R 4,513,972
237 4,513,973
239 4,513,974

CLASS 277

22 4,513,975
25 4,513,976
96.2 4,513,977
235 B 4,513,978

CLASS 279

4 4,513,979
51 4,513,980

CLASS 280

1.11 R 4,513,981
26 4,513,982
33.99 A 4,513,983
43.23 4,513,984
281 R 4,513,985
4,513,986
423 B 4,513,987
615 4,513,988
645 4,513,989
725 4,513,990

CLASS 283

1 R 4,513,991
94 4,513,992
103 4,513,993

CLASS 285

55 4,513,995
110 4,513,996
242 4,513,997
308 4,513,998

CLASS 290

40 C 4,514,643
40 R 4,514,642
53 4,514,644

CLASS 292

161 4,513,999
338 4,514,000
341.16 4,514,001

CLASS 293

118 4,514,002
128 4,514,003

CLASS 294

19.1 4,514,004
86.42 4,514,005

CLASS 296

78.1 4,514,006
183 4,514,007
204 4,514,008

CLASS 297

27 4,514,009
284 4,514,010

CLASS 299

42 4,514,011
57 4,514,012

CLASS 301

63 PW 4,514,013

CLASS 305

10 4,514,014

CLASS 307

10 R 4,514,645
200 B 4,514,646
269 4,514,647
350 4,514,648
450 4,514,649
466 4,514,650
475 4,514,651

CLASS 308

2 A 4,514,016
2 R 4,514,015
6 C 4,514,017
4,514,018

CLASS 310

54 4,514,652
178 4,514,653
216 4,514,654
218 4,514,655

CLASS 312

209 4,514,019
220 4,514,020
291 4,514,021

CLASS 313

11.5 4,514,656
130 4,514,657
402 4,514,658
412 4,514,659
446 4,514,660

CLASS 315

3 4,514,661
57 4,514,662
366 Re.31,876
4,514,663
383 4,514,664

CLASS 318

139 4,514,665
254 4,514,667
293 4,514,666
294 4,514,668
443 4,514,669
467 4,514,670
603 4,514,671
616 4,514,672
685 4,514,673
687 4,514,674
696 4,514,675
4,514,676
759 4,514,677
807 4,514,678

CLASS 323

222 4,514,679

CLASS 324

58.5 A 4,514,680
65 CR 4,514,681
71.3 4,514,682
110 4,514,683
120 4,514,684
142 4,514,685
4,514,686
158 R 4,514,687
208 4,514,688
4,514,689
225 4,514,690
301 4,514,691
329 4,514,692
338 4,514,693
429 4,514,694
437 4,514,695

CLASS 328

14 4,514,696

CLASS 329

104 4,514,697

CLASS 330

4.3 4,514,698
53 4,514,699
56 4,514,700
137 4,514,701
254 4,514,702
279 4,514,703
305 4,514,704

CLASS 331

2 4,514,705
16 4,514,706

107 SL 4,514,707

CLASS 333

255 4,514,708

CLASS 335

201 4,514,709
230 4,514,710
243 4,514,711

CLASS 336

96 4,514,712
4,514,713
100 4,514,714

CLASS 337

113 4,514,715
281 4,514,716
365 4,514,717
407 4,514,718

CLASS 339

17 CF 4,514,023
17 F 4,514,022
40 4,514,024
64 M 4,514,025
75 P 4,514,026
105 4,514,027
113 R 4,514,028
143 R 4,514,029
176 MP 4,514,030
205 4,514,031
255 P 4,514,033
278 C 4,514,032

CLASS 340

310 R 4,514,719
511 4,514,720
327 4,514,721
604 4,514,722
638 4,514,723
648 4,514,724
691 4,514,725
710 4,514,726
793 4,514,727
815.26 4,514,730
825.06 4,514,729
825.08 4,514,731
825.5 4,514,728
825.57 4,514,732

CLASS 343

5 MM 4,514,733
708 4,514,734

CLASS 346

1.1 4,514,735
76 PH 4,514,736
4,514,737
4,514,738
108 4,514,739
139 R 4,514,740
140 R 4,514,741
4,514,742
4,514,743
153.1 4,514,744
216 4,514,745

CLASS 350

6.3 4,514,055
96.15 4,514,054
4,514,057
96.20 4,514,034
96.23 4,514,035
4,514,036
4,514,037
4,514,058
162.13 4,514,038
162.16 4,514,059
162.2 4,514,053
255 4,514,039
286 4,514,040
331 R 4,514,042
337 4,514,041
341 4,514,043
350 R 4,514,044
351 4,514,045
372 4,514,056
385 4,514,046
394 4,514,047
423 4,514,048
425 4,514,049
444 4,514,050
465 4,514,051
466 4,514,052
632 4,514,060

CLASS 351

169 4,514,061
205 4,514,062

CLASS 353

28 4,514,063

CLASS 354

234.1 4,514,064
235.1 4,514,065
273 4,514,066
293 4,514,067
4,514,068
304 4,514,069
313 4,514,070
320 4,514,071
337 4,514,072
414 4,514,073
416 4,514,074
446 4,514,075
481 4,514,076

CLASS 355

3 BE 4,514,078
3 DD 4,514,077
8 4,514,079
14 C 4,514,080
14 R 4,514,081
54 4,514,082

CLASS 356

1 4,514,083
4 4,514,084
71 4,514,085
124 4,514,086
350 4,514,087
4,514,088
4,514,832

CLASS 357

38 4,514,747
58 4,514,748
68 4,514,749
70 4,514,750
71 4,514,751
72 4,514,752

CLASS 358

11 4,514,753
13 4,514,754
44 4,514,755
66 4,514,756
86 4,514,757
93 4,514,758
111 4,514,759
122 4,514,761
143 4,514,760
163 4,514,762
167 4,514,763
181 4,514,764
213 4,514,765
4,514,766
280 4,514,767
296 4,514,768
310 4,514,769

CLASS 360

69 4,514,770
73 4,514,771
75 4,514,772
77 4,514,773
95 4,514,774
96.6 4,514,775
121 4,514,776
128 4,514,777
133 4,514,778

CLASS 361

213 4,514,779
226 4,514,780
230 4,514,781
306 4,514,782
336 4,514,783
385 4,514,746
386 4,514,784
401 4,514,785
413 4,514,786
420 4,514,787
433 4,514,788

CLASS 362

95 4,514,789
183 4,514,790
249 4,514,791
294 4,514,792
306 4,514,793
439 4,514,794

CLASS 363

27 4,514,795

CLASS 364

142 4,514,796
148 4,514,797
188 4,514,798
200 4,514,799
4,514,800
4,514,801
4,514,802
4,514,803
4,514,804
4,514,805
4,514,806
4,514,807
4,514,808
422 4,514,809
424 4,514,810
424.1 4,514,811
473 4,514,812
474 4,514,813
4,514,814
478 4,514,815
4,514,816
480 4,514,817
521 4,514,818
556 4,514,819
858 4,514,820
862 4,514,821
900 Re.31,875
4,514,822
4,514,823
4,514,824
4,514,825
4,514,826

CLASS 365

1 4,514,827
8 4,514,828
189 4,514,829
200 4,514,830
203 4,514,831

CLASS 366

69 4,514,089
91 4,514,090
130 4,514,091
136 4,514,092
138 4,514,093
160 4,514,094
207 4,514,833
340 4,514,095

CLASS 367

141 4,514,834

CLASS 368

118 4,514,835

CLASS 369

74 4,514,836
219 4,514,837
254 4,514,838
270 4,514,839

CLASS 370

29 4,514,840
55 4,514,841
63 4,514,842
93 4,514,843

CLASS 371

8 4,514,844
15 4,514,845
16 4,514,846
51 4,514,847

CLASS 372

25 4,514,848
29 4,514,849
95 4,514,850

CLASS 373

27 4,514,851

CLASS 374

4,514,096

CLASS 375

1 4,514,852
34 4,514,853
94 4,514,854
97 4,514,855

CLASS 376

362 4,514,358

CLASS 377

8 4,514,856

CLASS 378

034 4,514,857
4,514,858
152 4,514,859

CLASS 384

93 4,514,097
95 4,514,098
100 4,514,099

CLASS 400

55 4,514,100
59 4,514,101

CLASS 401

78 4,514,102

CLASS 403

14 4,514,104
24 4,514,105
190 4,514,106
230 4,514,107
359 4,514,108
370 4,514,109

CLASS 405

104 4,514,110
260 4,514,111
269 4,514,112
286 4,514,113

CLASS 406

65 4,514,114

CLASS 408

139 4,514,115
161 4,514,116
239 R 4,514,117

CLASS 409

26 4,514,118
60 4,514,119
137 4,514,120
138 4,514,121
190 4,514,122
231 4,514,123
295 4,514,124

CLASS 411

82 4,514,125
477 4,514,126

CLASS 414

26.6 4,514,127
49 4,514,128
200 4,514,129
416 4,514,130
480 4,514,131
512 4,514,133
537 4,514,132
659 4,514,134
682 4,514,135
744 A 4,514,136

CLASS 415

1 4,514,137
4,514,138
90 4,514,139
119 4,514,140
160 4,514,141

CLASS 416

1 4,514,142
23 4,514,143
96 R 4,514,144
170 R 4,514,145
200 R 4,514,146

CLASS 417

288 4,514,147
403 4,514,148
4,514,149
440 4,514,150
540 4,514,151

CLASS 418

61 B 4,514,152
69 4,514,153
129 4,514,154
149 4,514,155
173 4,514,156
259 4,514,157

CLASS 420

436 4,514,359
454 4,514,360

CLASS 422

26 4,514,361
99 4,514,362

CLASS 423

3 4,514,363
4 4,514,364
15 4,514,365
18 4,514,378
21.5 4,514,367
54 4,514,368
4,514,369
228 4,514,379
318 4,514,366
344 4,514,370
417 4,514,380
449 4,514,371
493 4,514,372
495 4,514,373
497 4,514,374
573 G 4,514,375
588 4,514,376
648 A 4,514,377

CLASS 424

54 4,514,382
59 4,514,383
80 4,514,384
81 4,514,385
4,514,386
85 4,514,387
94 4,514,388
128 4,514,389

CLASS 425

78 4,514,158
125 4,514,159
143 4,514,160
154 4,514,161
174.8 R 4,514,162
204 4,514,163
208 4,514,164
311 4,514,165
436 R 4,514,166

CLASS 426

3 4,514,422
4,514,423
56 4,514,424
93 4,514,425
113 4,514,426
271 4,514,427
321 4,514,428
535 4,514,429
549 4,514,430
634 4,514,433
641 4,514,431
646 4,514,434
656 4,514,432

CLASS 427

8 4,514,435
10 4,514,436
39 4,514,437
54.1 4,514,438
4,514,439
85 4,514,440
126.6 4,514,441
140 4,514,442
230 4,514,443
242 4,514,444
410 4,514,445

CLASS 428

35 4,514,446
36 4,514,447
68 4,514,448
76 4,514,449
120 4,514,450
141 4,514,451
4,514,452
159 4,514,453
195 4,514,454
198 4,514,455
204 4,514,456
4,514,457
220 4,514,472
222 4,514,458
229 4,514,459
240 4,514,461
245 4,514,460
285 4,514,462
286 4,514,463
332 4,514,464
339 4,514,465
383 4,514,466
413 4,514,467
418 4,514,468
553 4,514,469
662 4,514,470
703 4,514,471

CLASS 429

10 4,514,473
27 4,514,474
35 4,514,475
94 4,514,476
98 4,514,477
196 4,514,478

CLASS 430

2 4,514,479
30 4,514,480
58 4,514,481
78 4,514,482
84 4,514,483
106.6 4,514,484
4,514,485
124 4,514,486
137 4,514,487
234 4,514,488
327 4,514,489
376 4,514,494
505 4,514,490
567 4,514,491
600 4,514,492
617 4,514,493

CLASS 432

11 4,514,167
14 4,514,168
106 4,514,170

CLASS 433

4 4,514,171
29 4,514,169
126 4,514,172
178 4,514,173
226 4,514,174

CLASS 434

82 4,514,175
224 4,514,176
328 4,514,177
395 4,514,178

CLASS 435

32 4,514,495
162 4,514,496
235 4,514,497
240 4,514,498
4,514,499
241 4,514,500
251 4,514,501
253 4,514,502

CLASS 436

60 4,514,503
85 4,514,504
500 4,514,505
518 4,514,506
4,514,507
4,514,508
4,514,509

CLASS 455

612 4,514,860

CLASS 474

204 4,514,179

CLASS 493

41 4,514,180
131 4,514,181
216 4,514,182

CLASS 494

27 4,514,183

CLASS 501

148 4,514,510

CLASS 502

8 4,514,511
107 4,514,512
112 4,514,513
121 4,514,514
154 4,514,515
202 4,514,516
220 4,514,517
229 4,514,518
243 4,514,519
337 4,514,520

CLASS 514

2 4,514,391
46 4,514,405
148 4,514,392
184 4,514,390
212 4,514,408
213 4,514,394
215 4,514,411
220 4,514,407
221 4,514,410
222 4,514,396
224 4,514,395
241 4,514,399
245 4,514,398
247 4,514,397
250 4,514,402
252 4,514,400
253 4,514,401
265 4,514,404
274 4,514,403
352 4,514,406
383 4,514,409
397 4,514,412
4,514,413
422 4,514,414
470 4,514,415
482 4,514,417
508 4,514,418
521 4,514,419
689 4,514,420
711 4,514,421

CLASS 518

700 4,514,521

CLASS 521

53 4,514,522
85 4,514,523
107 4,514,524
112 4,514,525
166 4,514,526

CLASS 523

115 4,514,527
120 4,514,528
200 4,514,529
456 4,514,530

CLASS 524

5 4,514,531
14 4,514,532
89 4,514,533
108 4,514,534
109 4,514,535
261 4,514,536
265 4,514,537
298 Re.31,874
315 4,514,538
436 4,514,539
514 4,514,540
4,514,541

CLASSIFICATION OF PATENTS

CLASS 525	
57	4,514,546
193	4,514,542
205	4,514,543
327.4	4,514,544
330.4	4,514,545
510	4,514,547
528	4,514,548
	4,514,549
538	4,514,550
CLASS 526	
233	4,514,551
301	4,514,552
323.1	4,514,553
339	4,514,554
CLASS 528	
9	4,514,555
117	4,514,556
342	4,514,557
388	4,514,558
CLASS 534	
690	4,514,559
CLASS 536	
1.1	4,514,560
7.2	4,514,562
18.7	4,514,561
123	4,514,563
CLASS 544	
25	4,514,564
	4,514,565
56	4,514,566
352	4,514,567
408	4,514,568
CLASS 546	
146	4,514,569
181	4,514,570
306	4,514,571
CLASS 549	
246	4,514,572
442	4,514,416
CLASS 564	
387	4,514,573
424	4,514,574
CLASS 568	
17	4,514,575
659	4,514,576
744	4,514,577
853	4,514,578

CLASSIFICATION OF DESIGNS

D1—	123	278,565
D2—	25	278,566
	27	278,567
	40	278,568
		278,569
	276	278,570
	279	278,608
	293	278,571
D3—	44	278,572
	48	278,573
	61	278,574
		278,575
D6—	317	278,576
	334	278,579
	349	278,580
	373	278,581
		278,582
	419	278,578
	426	278,583
	484	278,577
		278,584
	513	278,585
	531	278,586
	540	278,587
D7—	9	278,589
	13	278,590
		278,591
		278,592
	29	278,588
D8—	25	278,594
	83	278,593
	389	278,595
D9—	341	278,596
	349	278,597
	353	278,598
	377	278,599
	399	278,600
	433	278,601
	449	278,602
	453	278,603
	457	278,604
D10—	30	278,605
	56	278,606
	111	278,607
D11—	2	278,609
	30	278,610
	67	278,611
	107	278,612
	152	278,613
		278,614
D12—	101	278,615
	115	278,616
	147	278,617
		278,618
	166	278,619
	180	278,620
	190	278,621
	317	278,622
D13—	24	278,623
		278,624
D14—	12	278,625
	53	278,626
	77	278,627
		278,628
	80	278,629
	115	278,630
D15—	7	278,631
D17—	14	278,632
	22	278,633
		278,634
D18—	1	278,635
		278,636
		278,637
	35	278,638
D19—	28	278,639
		278,640
	77	278,641
D21—	64	278,642
	128	278,643
	142	278,644
	161	278,645
	188	278,646
	190	278,647
		278,648
	230	278,649
D23—	3	278,650
	40	278,651
	136	278,652
D24—	22	278,653
	26	278,656
	27	278,654
	52	278,655
	64	278,657
D26—	60	278,658
	85	278,659

CLASSIFICATION OF PLANTS

P.—	7	5,448
	10	5,449
		5,450
	14	5,451
	18	5,452
	38	5,453
	41	5,454
		5,455
		5,456
	50	5,457

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,513,513
4,513,810
4,514,366
4,514,684
4,514,690
02 : 4,513,986
04 : 4,513,461
4,513,533
4,513,548
4,513,598
4,513,772
4,513,859
4,514,122
4,514,424
4,514,489
4,514,580
4,514,632
4,514,639
4,514,648
4,514,651
4,514,696
4,514,707
4,514,815
4,514,842
4,514,844
06 : 4,513,472
4,513,484
4,513,486
4,513,494
4,513,499
4,513,537
4,513,568
4,513,629
4,513,642
4,513,645
4,513,651
4,513,661
4,513,726
4,513,730
4,513,734
4,513,749
4,513,752
4,513,763
4,513,788
4,513,793
4,513,800
4,513,818
4,513,824
4,513,848
4,513,905
4,513,906
4,513,913
4,513,917
4,513,936
4,513,938
4,513,940
4,513,942
4,513,947
4,513,961
4,513,962
4,513,967
4,514,004
4,514,016
4,514,023
4,514,024
4,514,029
4,514,055
4,514,056
4,514,057
4,514,085
4,514,087
4,514,101
4,514,132
4,514,135
4,514,137
4,514,139
4,514,171
4,514,176
4,514,195
4,514,215
4,514,246
4,514,249
4,514,278
4,514,319
4,514,362
4,514,363
4,514,368
4,514,369
4,514,379
4,514,461
4,514,474
4,514,479
4,514,620
4,514,623
4,514,633
4,514,640
4,514,644
4,514,650
4,514,671
4,514,672
4,514,673
4,514,681
4,514,683
4,514,692
4,514,698
4,514,704
4,514,710
4,514,722
4,514,723
4,514,739
4,514,741
4,514,769
4,514,771
4,514,772
4,514,778
4,514,789
4,514,799
4,514,817
4,514,824
4,514,827
4,514,832
4,514,834
4,514,849
4,514,850
4,514,858
08 : 4,513,561
4,513,665
4,513,667
4,513,760
4,514,047
4,514,117
4,514,252
4,514,522
4,514,753
09 : Re.31,875
4,513,490
4,513,567
4,513,584
4,513,704
4,513,705
4,513,746
4,513,889
4,513,985
4,514,005
4,514,102
4,514,143
4,514,161
4,514,179
4,514,255
4,514,359
4,514,360
4,514,442
4,514,469
4,514,470
4,514,475
4,514,528
4,514,688
4,514,726
10 : Re.31,874
4,513,895
4,514,211
4,514,214
4,514,292
4,514,455
4,514,541
11 : 4,514,653
12 : 4,513,469
4,513,529
4,513,563
4,513,590
4,513,690
4,513,727
4,513,735
4,513,739
4,513,851
4,513,971
4,514,020
4,514,107
4,514,121
4,514,173
4,514,197
4,514,427
4,514,584
4,514,779
4,514,823
4,514,825
13 : 4,513,476
4,513,508
4,513,553
4,513,951
4,514,027
4,514,540
15 : 4,513,542
4,513,907
4,514,695
17 : 4,513,510
4,513,532
4,513,535
4,513,549
4,513,554
4,513,555
4,513,557
4,513,603
4,513,660
4,513,669
4,513,674
4,513,682
4,513,695
4,513,736
4,513,740
4,513,769
4,513,785
4,513,796
4,513,863
4,513,885
4,513,888
4,513,892
4,513,894
4,513,946
4,513,964
4,513,993
4,514,014
4,514,030
4,514,037
4,514,050
4,514,056
4,514,072
4,514,077
4,514,100
4,514,148
4,514,175
4,514,190
4,514,279
4,514,316
4,514,332
4,514,510
4,514,516
4,514,532
4,514,552
4,514,598
4,514,652
4,514,687
4,514,703
4,514,708
4,514,761
4,514,764
4,514,836
4,514,845
18 : 4,513,585
4,513,811
4,513,855
4,514,105
4,514,106
4,514,130
4,514,192
4,514,326
4,514,334
4,514,509
4,514,564
4,514,586
4,514,686
4,514,763
19 : 4,514,025
20 : 4,513,617
4,513,828
4,513,837
4,514,202
4,514,312
21 : 4,513,607
4,513,679
4,513,756
4,513,797
4,513,804
4,514,177
4,514,180
4,514,181
4,514,244
4,514,444
4,514,603
22 : 4,513,545
4,513,657
4,514,373
4,514,374
4,514,550
4,514,554
4,514,575
24 : 4,513,578
4,513,989
4,514,086
4,514,113
4,514,495
4,514,506
4,514,527
4,514,561
25 : 4,513,518
4,513,591
4,513,592
4,513,624
4,513,683
4,513,773
4,513,831
4,513,874
4,513,879
4,514,046
4,514,048
4,514,061
4,514,062
4,514,063
4,514,065
4,514,069
4,514,070
4,514,088
4,514,330
4,514,388
4,514,464
4,514,468
4,514,476
4,514,533

4,514,569
4,514,581
4,514,587
4,514,594
4,514,631
4,514,689
4,514,717
4,514,802
4,514,806
4,514,820
26 : 4,513,462
4,513,468
4,513,530
4,513,602
4,513,631
4,513,633
4,513,640
4,513,684
4,513,777
4,513,780
4,513,784
4,513,807
4,513,833
4,513,836
4,513,898
4,513,923
4,513,937
4,513,976
4,513,980
4,513,991
4,513,997
4,514,002
4,514,013
4,514,108
4,514,120
4,514,126
4,514,133
4,514,147
4,514,209
4,514,242
4,514,267
4,514,301
4,514,325
4,514,407
4,514,437
4,514,548
4,514,549
4,514,574
4,514,577
4,514,583
4,514,712
4,514,774
4,514,797
4,514,811
27 : 4,513,471
4,513,527
4,513,539
4,513,754
4,513,875
4,513,918
4,513,972
4,514,007
4,514,045
4,514,193
4,514,352
4,514,434
28 : Re.31,873
4,513,528
4,514,356
29 : 4,513,452
4,513,460
4,513,574
4,513,899
4,513,900
4,514,182
4,514,273
4,514,320
4,514,340
4,514,343

4,514,519
4,514,792
30 : 4,513,963
4,514,262
33 : 4,513,496
4,513,825
4,514,729
4,514,758
4,514,775
34 : 4,513,455
4,513,501
4,513,505
4,513,511
4,513,573
4,513,623
4,513,692
4,513,747
4,513,748
4,513,757
4,513,761
4,513,789
4,513,871
4,513,891
4,513,912
4,513,932
4,513,966
4,513,981
4,514,094
4,514,165
4,514,189
4,514,239
4,514,247
4,514,250
4,514,256
4,514,265
4,514,288
4,514,310
4,514,314
4,514,321
4,514,324
4,514,337
4,514,341
4,514,354
4,514,361
4,514,376
4,514,378
4,514,382
4,514,383
4,514,391
4,514,410
4,514,411
4,514,414
4,514,419
4,514,422
4,514,429
4,514,431
4,514,438
4,514,453
4,514,503
4,514,517
4,514,524
4,514,539
4,514,545
4,514,553
4,514,579
4,514,582
4,514,647
4,514,658
4,514,663
4,514,728
4,514,748
4,514,749
4,514,756
4,514,760
4,514,821
4,514,843
4,514,853
35 : 4,513,732
4,514,067

36 : 4,513,454
4,513,463
4,513,488
4,513,492
4,513,502
4,513,519
4,513,524
4,513,546
4,513,559
4,513,613
4,513,670
4,513,771
4,513,775
4,513,801
4,513,857
4,513,862
4,513,870
4,513,901
4,513,939
4,513,959
4,513,965
4,513,970
4,514,009
4,514,053
4,514,089
4,514,093
4,514,178
4,514,205
4,514,232
4,514,254
4,514,268
4,514,306
4,514,311
4,514,315
4,514,331
4,514,390
4,514,440
4,514,450
4,514,466
4,514,478
4,514,481
4,514,499
4,514,500
4,514,505
4,514,508
4,514,538
4,514,591
4,514,612
4,514,662
4,514,674
4,514,694
4,514,724
4,514,734
4,514,751
4,514,752
4,514,803
4,514,829
4,514,846
37 : 4,513,589
4,513,632
4,513,791
4,514,131
4,514,350
4,514,392
4,514,492
4,514,601
4,514,697
4,514,800
39 : 4,513,459
4,513,507
4,513,522
4,513,558
4,513,600
4,513,656
4,513,733
4,513,768
4,513,795
4,513,844
4,513,853

4,513,860
4,513,864
4,513,881
4,513,903
4,513,915
4,513,933
4,513,957
4,513,975
4,513,979
4,513,983
4,514,003
4,514,144
4,514,199
4,514,208
4,514,243
4,514,266
4,514,345
4,514,353
4,514,355
4,514,460
4,514,521
4,514,529
4,514,535
4,514,536
4,514,557
4,514,619
4,514,665
4,514,718
4,514,725
4,514,780
4,514,812
4,514,819
4,514,851
40 : 4,513,521
4,513,614
4,513,618
4,513,625
4,513,681
4,513,829
4,514,282
4,514,293
4,514,308
4,514,514
4,514,588
4,514,602
41 : 4,513,987
4,514,022
4,514,201
4,514,207
4,514,590
42 : 4,513,451
4,513,493
4,513,495
4,513,506
4,513,523
4,513,594
4,513,606
4,513,643
4,513,647
4,513,654
4,513,666
4,513,671
4,513,686
4,513,731
4,513,741
4,513,779
4,513,839
4,513,852
4,513,884
4,513,969
4,514,032
4,514,125
4,514,167
4,514,174
4,514,204
4,514,213
4,514,220
4,514,271
4,514,281

4,514,291
4,514,294
4,514,307
4,514,322
4,514,347
4,514,384
4,514,394
4,514,400
4,514,436
4,514,439
4,514,447
4,514,456
4,514,458
4,514,504
4,514,531
4,514,534
4,514,543
4,514,567
4,514,576
4,514,585
4,514,614
4,514,642
4,514,643
4,514,659
4,514,660
4,514,661
45 : 4,513,485
4,513,514
4,513,560
4,513,878
4,513,960
4,514,134
4,514,200
4,514,335
4,514,454
4,514,462
4,514,465
46 : 4,513,456
4,513,526
47 : 4,513,547
4,513,586
4,513,786
4,513,904
4,513,984
4,513,994
4,514,000
4,514,033
4,514,426
4,514,570
4,514,600
48 : 4,513,449
4,513,478
4,513,498
4,513,575
4,513,576
4,513,612
4,513,676
4,513,688
4,513,764
4,513,815
4,513,817
4,513,819
4,513,820
4,513,821
4,513,822
4,513,823
4,513,840
4,513,856
4,513,865
4,513,869
4,513,883
4,513,944
4,514,028
4,514,097
4,514,098
4,514,103
4,514,168
4,514,248

4,514,261
4,514,283
4,514,285
4,514,286
4,514,309
4,514,336
4,514,380
4,514,385
4,514,428
4,514,430
4,514,497
4,514,498
4,514,518
4,514,530
4,514,627
4,514,636
4,514,637
4,514,691
4,514,693
4,514,706
4,514,727
4,514,735
4,514,750
4,514,770
4,514,801
4,514,805
4,514,809
4,514,828
49 : 4,513,706
4,513,866
4,513,934
4,514,026
4,514,263
50 : 4,513,540
4,513,541
51 : 4,513,467
4,513,497
4,513,577
4,513,595
4,513,604
4,513,641
4,513,664
4,513,750
4,514,059
4,514,092
4,514,142
4,514,327
4,514,677
4,514,732
4,514,814
53 : 4,513,644
4,513,687
4,513,842
4,513,919
4,514,019
4,514,421
54 : 4,514,537
55 : 4,513,466
4,513,500
4,513,776
4,513,809
4,513,845
4,513,847
4,513,850
4,513,858
4,513,887
4,513,897
4,513,909
4,513,910
4,513,955
4,514,015
4,514,123
4,514,128
4,514,184
4,514,425
4,514,606
4,514,685
4,514,784

DESIGN PATENTS

04 : 278,631
06 : 278,576
278,581
278,585
278,600
278,604
278,615
278,621
278,624
278,633

278,634
278,639
278,646
278,647
278,648
278,650
278,651
278,655
09 : 278,593
278,656

12 : 278,582
16 : 278,652
18 : 278,597
19 : 278,622
22 : 278,601
25 : 278,640
26 : 278,609
278,659
27 : 278,566
278,588

278,623
278,654
31 : 278,613
34 : 278,603
278,630
278,653
36 : 278,577
278,584
278,589
278,590

278,591
278,592
278,596
278,602
39 : 278,568
278,569
278,574
278,608
40 : 278,614

41 : 278,616
278,620
42 : 278,611
48 : 278,632
278,642
51 : 278,580
53 : 278,567
278,578
56 : 278,594

PLANT PATENTS

06 : 5,451
5,452
5,453
5,454
5,455
5,456
25 : 5,449
5,450
39 : 5,448
41 : 5,457

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, Acting Commissioner